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November, 1958

Volume 1, Number 2

FEATURES

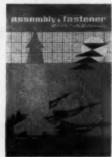
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Meets Health Codes-Cuts Assembly Costs

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Will it perform as expected? Each count down spotlights the role of proper assembly and fastening techniques in national defense and scientific advancement. "Shooting for the moon" requires near 100 percent product reliability.



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On-the-spot examination of historical data at Greenlee Brothers and Company, Rockford, Illinois brought together (left to right) J. A. Lengquist, Manager of Greenlee's Wood Working Machinery Department; Elsiebeth McDaniel, Editor, Hitchcock's Wood Working; and Darrell Ward, Hitchcock's Field Editor.

THE MEN FROM HITCHCOCK

on one of their many field trips to seek out information for the forthcoming 60th Anniversary Issue of Hitchcock's Wood Working. This continuous and persistent effort on the part of Hitchcock's editorial staff will prove to be the big reason why the November Wood Working will be the outstanding issue of the year in this field. Readers will be extremely interested in the reports comparing old machinery and methods to their modern counterparts. Special editorial features like "Yesterday's Progress—Today's Reality," "Frightening New Developments Prove Beneficial," "Adhesives—Past, Present and Future" and What Makes a Wood Popular" provide assurance that this issue will be read, re-read, talked about and saved.

Hitchcock's Wood Working publication, like the products manufactured by Greenlee, a consistent and satisfied Wood Working advertiser for over 50 years, has followed the trend of industry—always reporting up-to-the-minute trends, new markets, new machinery and new methods in a manner that has developed an outstanding readership record. This readership assures you, as an advertiser, that your sales-message will be read by the prime buyers in this industry at a time when they are editorially preconditioned to be most receptive to your new ideas, equipment and methods.

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SINCE 1898

THE PIONEER OF CONTROLLED CIRCULATION

FAST, HAMMER-DRIVEN RIVET ECONOMICAL FOR BLIND AND OPEN APPLICATIONS

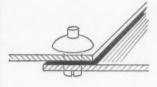


Fig. 1 Inserted in hole, Southco Rivets are quickly set by driving pin with hammer. No special tools are required. Bucking is not necessary.

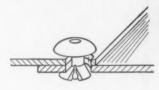


Fig. 2 Expanded prongs force sheets or parts together, hold them tightly in compression. No metal is removed, no grinding or finishing is required.

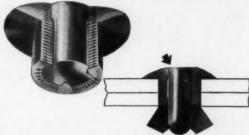
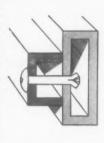


Fig. 3 Pin is locked securely into rivet by displaced metal filling unique grooves. Compression forces are utilized for greater strength.



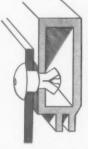


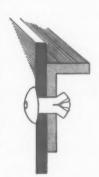






Fig. 4 Ideally suited for "blind" applications, Southco Rivets are worked by one man from one side only and require minimum space inside closed area. They eliminate costly bucking

arrangement or time-consuming finishing. Supplied as a unit, they require no job time for assembly or fitting.





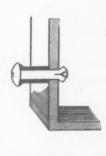


Fig. 6 Ferrules are used as spacers for numerous applications. Here the Southco Rivet forms a drawer pull in conjunction with a flanged tube.



Fig. 7 Increased head size distributes holding pressure over larger area, permits higher loading on wood, plastics and similar materials.



Fig. 8 A blind head can be formed inside the wood. This application is particularly useful when it is desirable to have one surface of the wood unmarred.

FREE

RIVET FOLDER



Send for your free copy of "Southco Drive Rivets" Folder. Gives complete information on the application, installation, and specifications of aluminum and steel Drive Rivets.

Write on your letterhead to Southco Division, South Chester Corporation, 257 Industrial Highway, Lester, Pennsylvania.



















NUTS

Ten fastening problems solved by ELASTIC STOP nuts

BOLT

THE

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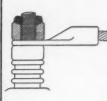
ANYWHERE

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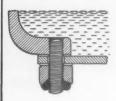
IGHTENED AGAINST THE WORK



Vibration and impact proof bolted connections in standard applications.



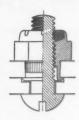
On all electrical terminals subjected to vibration in transit or operation, and for any electrical or electronic assembly where positive contact must be maintained.



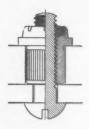
To seal bolt threads where leakage past stud threads must be prevented.

MANY SPECIAL FUNCTIONS

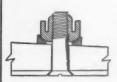
FOR



Blind fastening applications where nut is "clinched" into sheet metal ... becoming self-retaining as well as self-locking.

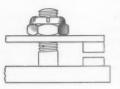


To eliminate drilling and tapping and provide steel thread strength for soft metals, an ESNA spline nut is pressed into a bored hole in casting.

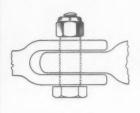


Simplified self-aligning self-locking fastener for bolting two non-parallel surfaces.

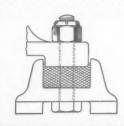
Spring-mounted connections or dynamic balancing, where nut must stay put yet be easily adjusted. (Flanged face eliminates need for extra washers.)



On make and break adjustment studs where accurate contact gaps must be maintained. Note "thin" height design for limited clearance.



For bolted connections requiring predetermined play.



For rubber-insulated and cushion mountings where the nut must not work up or down.

HOW THESE NUTS SOLVE SO MANY FASTENING PROBLEMS, ELIMINATING EXTRA PARTS AND OPERATIONS...

The red locking collar of an ELASTIC STOP® nut grips boilt threads with a perfect fit that will not loosen under severe vibration or stress reversals, and seals against liquid seepage. By bringing nut and bolt metal thread flanks into firm contact it eliminates wear producing axial play. The elastic locking action of the insert-type stop nut does not distort or gall bolt threads. It is reusable many times.

Send for the following free information: Elastic Stop nut bulletin; Rollgin® bulletin. Or enclose a drawing of your product for specific self-locking fastener recommendations. Write to Dept. N30-1197.





THE EDITOR'S VIEW

NOVEMBER, 1958 VOL. 1, NO. 2

THERE'S MORE FALLING THAN AUTUMN LEAVES



A six-year-old girl was raking leaves in the yard of her home in Minneapolis, fully confident that home is the safest place to play. Without warning she was felled by a metal object out of the skies. It was a six-inch hinge from the landing gear cover of a jet plane. The cover itself, about three feet long, severed a power line only 300 feet from her home.

Why did the landing gear cover come loose? Was it the result of faulty design, improper assembly, inadequate inspection at the factory, or slipshod maintenance and inspection at the hangar? No matter where the fault lay, there was a lack of product reliability. And a child was critically injured.

Without doubt the utmost attention was given to the engine and other "important" components of the airplane—all the way from the design board to the end of the assembly line. But what about the hinge on the landing gear cover? Was it relegated to the role of just a minor part whose reliability was not deemed important to the over-all performance of the aircraft?

To the little girl, the reliability

of this hinge was more important than that of the rest of the airplane.

Now look at the many other accidents which occur daily in the home, in the plant, and on the highway. True, a high percentage of these accidents are due to errors in judgment on the part of the persons involved. But consider any accident whose cause can be traced to an inferior component or a short-cut assembly practice which saved a few production pennies. Since the product failed, wasn't this in reality due to an error in judgment on the part of the manufacturer?

But where does the responsibility rest? Top management, at least in most companies, is vitally concerned with quality products. Equally concerned are the design and production men. But when a product fails in service, it's hard to pinpoint the responsibility.

What does all this add up to? Simply this, everyone from the president down to the final inspector must be concerned with the reliability of the over-all product—from the largest component to the smallest fastener.

most S. Denetz

Managing Editor



finger se for

STRAIGHT LEGS WON'T DISTORT

GREATLY INCREASED

Pull-out resistance

PATENT PENDING





ROUND HEAD

SQUARE HEAD



RECTANGULAR

TABLE OF DIMENSIONS

For use with #8 or #10 screws, finished hole size .290/.281, application thickness .030/.060. Other sizes available soon.

HEAD SIZE	HEAD HEIGHT	
7/16" DIA.	.150	
1/2" DIA.	.030	
1/2" DIA.	.040	
1/2" DIA.	.070	
1/2" DIA.	.150	
1/2" DIA.	.100	
3/8" SQ.	.040	
3/8" SQ.	.140	
13/32" SQ.	.030	
13/32" SQ.	.200	
3/8" x 37/64"	.060	

This new Dot Nylon Push-in Nut offers additional design and performance advantages over our currently available plastic snap-in nuts. These advantages are:

(1) Straight legs permit easy insertion in square, punched holes and do not distort the holes even in soft aluminum or thin-gauge steel. (2) Burrs do not impede the nut or prevent proper seating. (3) Tapered screw hole causes legs to spread when screw is inserted and results in greatly increased pull-out resistance (see drawing A).

Ordinary sheet metal screws cut clean, strong threads in the molded nylon and the nut is both re-usable and highly resistant to vibration.

Used as a nut or as a spacer, Dot's Nylon Push-in Nut has wide application in all products where sheet metals or plastics are employed. They can be supplied with a moisture resistant sealer and special nuts can be designed to your specifications if volume warrants. Currently available in eleven sizes. Full information on request.

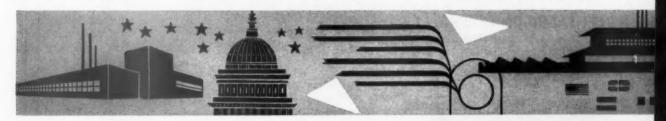
CARR FASTENER COMPANY

Division of United-Carr Fastener Corp., Cambridge 42, Mass.

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The State of Business



Our late recession has a unusual aspect in that consumers, in general, continued to spend at a rate not far below the boom peak. As a matter of fact they actually spent more (because prices went higher) for food, clothing and services. What hurt was that they spent less for cars, television sets, appliances, and so on. But now the changing direction of consumer spending is plain to see.

The monthly economic review of the First National City Bank of New York points out that more than half the drop in industrial production during the recession had been regained in the last four months. According to the bank this has been due to a shift in inventory and purchasing policies, stronger consumer demand, larger government spending and an upturn in home building. Altogether, it would appear that the sharpest postwar recession is ending with the sharpest upswing.

As we entered the fourth quarter, however, Charles H. Kellstadt, president of Sears, Roebuck & Co., predicted a gradual improvement, rather than a great boom. For his own business, he predicts a volume gain of about 3 per cent this year over '57. And Nels G. Severin, president of the National Association of Home Builders, estimates that 1,100,000 dwelling units will be completed this year, compared with last year's 989,000. He also calls attention to a relatively low inventory, indicating that sales are keeping up with production.

Steel production levels have had major support from construction, as a matter of fact, and recent quickening of demand from agricultural areas for steel reflects construction activity there. Meantime, improvement in miscellaneous orders, an extension in delivery dates for some products, and promise of stronger demand for plates and shapes is indicated.

No major spurt is expected in steel soon, although many steel users have been placing larger orders. Maintaining a competitive position from a delivery standpoint is one problem of producers,

particularly in inventories of semi-finished steel and hot-rolled sheets. The flow of orders reaching mills on fringe areas of steel-producing districts shows that buyers are going farther afield in order to obtain fast deliveries. Naturally additional support from auto makers as they settle into volume production is an important factor in increased steel production.

A little-noticed development in the Middle East is the first "oil conference" of the Arab League in Cairo. Its outcome may lead to developments of grave importance for business and American foreign policy. Venezuela, smarting over current U. S. import restrictions, and non-Arab Iran also are participants. Among proposals due for discussion (and threats to the present arrangements) are plans for an all-Arab pipeline parallel to present Western-controlled lines, and establishment of an all-Arab tanker fleet.

The impact of the road-building program will begin to make itself felt in many segments of the economy next year, and it will continue to exert significant influence for many years to come. Indeed, it has been suggested that the Federal road-building program will have produced on completion not only more and better roads, but "a new transportation system, surpassing in its impact the great railroad and canal-building booms that so radically altered the face of the economy in the last century. But we also need badly other major public work programs—schools, sewerage and water systems, for example. Question: Will the \$40 billion-worth of new highways drain off money from other and perhaps more urgent needs?"

That consumers again are in a buying mood is reflected in the fact that Federal Reserve Board figures on consumer installment credit, which showed an increase in August for the first time

continued

NEW BARTITE' SEALING WASHERS

stop fastener leakage
...3-way action
gives complete seal!



SEALS UP BETWEEN FAS TENER HEAD AND WASHER



3 SEALS DOWN BETWEEN HOLE AND THREAD

A revolutionary new type of washer with sealing compound adhered to the underside ...makes any threaded fastener completely leakproof against liquids or vapors.

The washer is partially dome-shaped with flattened perimeter which makes smooth, even contact when tightened down.

The stable, non-aging sealing compound is chemically inert, will not split or ozone-check under high pressure, withstands temperatures from $-100^\circ F$. to $+250^\circ F$. without change. It provides a secure seal against water, oils, acids, salts, hydrocarbons, etc. When applied to a flat or curved surface under torque the washer does not turn... compression of dome shape forces live sealant into 3-way seal.

BARTITE Sealing Washers are available in all standard screw or bolt sizes through ½" dia., with a choice of metals and finishes. If your product or building requires sealing, you can eliminate costly and troublesome rejects and repairs by assembling with BARTITE Sealing Washers, which make leakproofing a reality! Washer construction allows pre-assembly with fasteners to speed production—inquire about this feature from your regular screw supplier. Write for samples and descriptive bulletin B-10.



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The State of Business, continued

since January, continue to show a rise. Auto credit has been lagging notably, but it is expected that new model buying will alter that lag.

Business in politics in this year's campaigns has put to test the timeworn argument that a company may offend customers by openly endorsing a policy or polical party. Boeing, General Electric, Gulf Oil, Ford Motor, Johnson & Johnson, and Timken Roller Bearing are just a few of the companies that pitched in this year to stir up some goodcitizen political activity among executives and workers.

From organized labor's standpoint there's nothing wrong with
the idea, provided there's no coercion and a man's job is not put
in jeopardy. Commenting on the
subject, one management publication asks: "Is it just another
version of 'countervailing power,'
wherein business as a group opposes labor as a group? Or is it
something broader and better,
which will help sustain the
greater political and economic
in stitutions that have made
America?"

It's too early at this point for a clear-cut answer, but there are some straws in the wind. Item: Ford Motor Company, among other things, sent lists of volunteer campaign workers to chairmen of both major parties. Item: Aerojet-General urged every worker to donate at least \$2 to the part of his choice, and just so there's no misunderstanding about job-jeopardy, the company president, former Secretary of the Navy Dan Kimball, kicked in with \$500 for the Democrats; vice-president Arthur H. Rude backed the Republicans for a like

Much of the business gain in the third quarter was due to government spending. In the fourth quarter it's likely to go forward at an annual rate of \$94.8 billion for goods and services, or nearly \$6.5 billion above the rate at this time last year. But some of the gain is due to replenishment of inventories that were allowed to

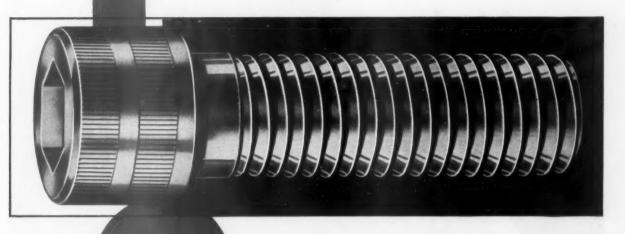
run very low during the past several quarters.

Home freezers led recovery in the major appliance field, one of the earliest and hardest-hit of recession victims. The rural market has always been the big one for this appliance, and farmers have money to spend during this fall and winter buying season. But the home laundry group, particularly automatic washers and driers, also are selling well. Refrigerators, electric ranges and water heaters are experiencing lesser gains but recovery nevertheless. The recent increase in home building is a factor here. Philco brought out its 1959 models six weeks ahead of schedule to meet dealer and distributor demands for fall merchandise. Call-back of laidoff workers in appliance plants all across the country is a cheering note in the over-all picture.

Engineer shortage. One would think that by now enough attention had been concentrated on the "shortage of engineers" to bring about an increase in the supply. Not so, apparently. The Labor Department says steppedup missile production has again scraped the cupboard bare. A month ago it had job openings for 4335 engineers—1400 more than in July.

The outlook for farm equipment is rosy. "As it appears to us now, 1959 will be a good year for the farm equipment business," said Frank W. Jenks, president of International Harvester Company, at a recent industry meeting. Carl L. Hecker, president of Oliver Corporation, thinks the year will equal '58 "and possibly be a little better." R. S. Stevenson, president of Allis-Chalmers, estimated that '58 will show a sales total that could exceed last year by ten to 15 per cent. William A. Hewitt, president of Deere & Co., figured it is too early to make a fair estimate for next year, settled instead for a cautious comment on 1958: "All in all, I feel that the year should be a relatively good one for the farm equipment industry."

fewer fasteners the better. If possible, three fasteners should do the work of four. Surface must be flush to give a smooth, streamlined appearance to the product. Only a limited wrenching space is available..."



SCREWS. Made of special analysis alloy steel heat-treated to 38-42 Rockwell "C" hardness. Sockets are scientifically proportioned for highest strength. Internal hex socket drive assures a smooth, unmarred head. New forging method results in improved fiber flow, tougher screws. Threads are Unified Class 3A fit.

For the finest in Hex Socket Screws . . . for unmatched Same-Day Service, the name to remember is Holo-Krome.

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THE HOLO-KROME SCREW CORPORATION . HARTFORD 10. CONN.



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SCREWSTICK saves money. It can cut assembly costs by as much as 4 to 1

It can do this because SCREWSTICK feeds fasteners automatically from a power driver in a one-piece stick of identical fasteners. It eliminates manual handling of small screws, stops costly fumbling and combines high fastening strength with quick assembly.

Just as important is the ease of alignment between the screw and threaded hole and a constant, measured torque which is built into the product that provides uniform tightening.

SCREWSTICK is readily adaptable to compact, lightweight, portable drivers. Sizes from No. 0 to

No. 6 in diameter, custom-engineered in machine screw or self-tapping types to meet your own requirements. They are mass-produced in the convenient, easy-to-handle SCREWSTICK form.

Find out for yourself how you can apply precision and ease of assembly to reduce assembly costs. Take advantage of American's custom engineering service for your fastening applications.

Send for free sample and engineering and application data.

Write American Screw Company, Willimantic, Conn.

The biggest news in fasteners comes from . .



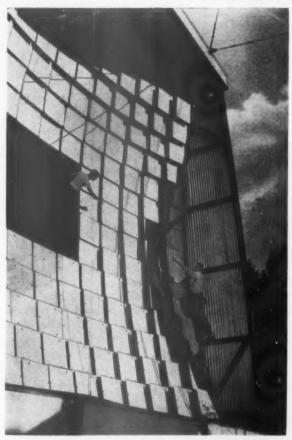
AMERICAN SCREW CO., WILLIMANTIC, CONN. NORRISTOWN, PA. . CHICAGO, ILL. . DETROIT, MICH.

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Industry at Work



SOLAR FURNACE SIMULATES THERMAL RADIATION OF A-BOMB BLAST



A concave framework of 180 mirrors compose the Army's new solar furnace designed for high thermal flux.

Dedication of the Army's giant solar furnace at the Quartermaster Research & Engineering Command in Natick, Mass. was another step in the current race to harness the sun.

Although designed for high thermal flux, rather than high temperature, a sample exposed to the furnace's concentrated energy should be able to reach 5000° F at the image position causing even tungsten to boil. This closely simulates the thermal radiation which would be received by the materials or personnel in the vicinity of nuclear-weapons explosions.

The spherically concave mirror framework, or concentrator, is the heart of the furnace and is composed of 180 spherical mirrors manufactured by The American Optical Company. Each mirror is 2' x 2' and made to an exact curve through a special slumping method. All are contained in a 30 sq. ft. frame.

Concentration of the sun's radiation results in an image of approximately 4" in diameter focused within the test chamber of the furnace.

64.000 ADDITIONS A SECOND WITH COMPUTER

It performs 64,000 additions or takes 16,000 square roots per second!

This demonstrates the amazing speed of the C-1100 computor, world's fastest and first all-transistor airborne computer, developed by Gerhard L. Hollander at Philco Corp. and now in production.

Operating 10 times faster than any commercially available airborne computer, the miniature Transac will handle all computational requirements necessary to control jet aircraft: autopilot, air data, cruise control, automatic navigation and engine performance, as well as weapon delivery and interception.

Size, weight and power consumption is reduced by using small transistors in place of bulky vacuum tubes and electro-mechanical devices. The

continued



Miniature circuit panels are the heart of the Philco Transac airborne computer. They control all arithmetic and control functions.

typical computor contains about 3500 transistors, 2300 resistors, 280 capacitors and 20 core memory planes.

MODEL MANNED SPACE SHIP TO BE DESIGNED BY 1959

By Fall 1959 an industry team plans to have designed a practical model of a manned space ship capable of orbiting the earth in two hours.

Joining the Air Force in Operation Dyna-Soar (dynamic soaring) is The Martin Co., Bendix Aviation, Bell Aircraft, Minneapolis-Honeywell Regulator, Goodyear Aircraft and American Machine and Foundry.

Many problems face the team before a ship which can re-enter the atmosphere and land at any chosen air base is operational. Bendix, for example, working on communications, is investigating ways to make radio contact through the electrically charged (ionized) particles that surround an orbital vehicle.

ALL-WELDED STEEL DOME 120' HIGH, 384' DIAMETER

A huge golden dome rising just north of Baton Rouge, La., may be the forerunner of a new type of industrial structure— the geodesic dome.

Constructed by the Union Tank Car Co. as a regional repair and maintenance facility, the dome is the world's largest, first all-welded, first to be fabricated entirely of steel. It has no internal supports and stands 120' high, enclosing 110,000 sq. ft.

Inside the structure is another geodesic-type dome, 80' high, housing offices, employee quarters, materials storage and a control tower.

The dome consists of 321 hexagonal steel panels welded together and strengthened by a spider web framework of rods and pipes, costing less than \$10 per sq. ft. covered. Only seven items were



required on the bill of materials: standard eleven gage (1/8") sheet steel, 4" pipe, 11/2" and 3/4" rod, 2" pipe sleeve, 11/2" nuts and washers.

A similar dome is now being constructed in Wood River, Ill.

"THIS IS EARTH CALLING . . . COME IN MARS."

Radio communication between the earth and Mars is well within reach, says William F. Main, manager of the electronics research division of Lockheed Missiles.

Main told a meeting of the American Rocket Society and Institute of Radio Engineers that it would take "little extension of present techniques" to be able to communicate with a space vehicle near Mars, 35 million miles away.

This range would require a

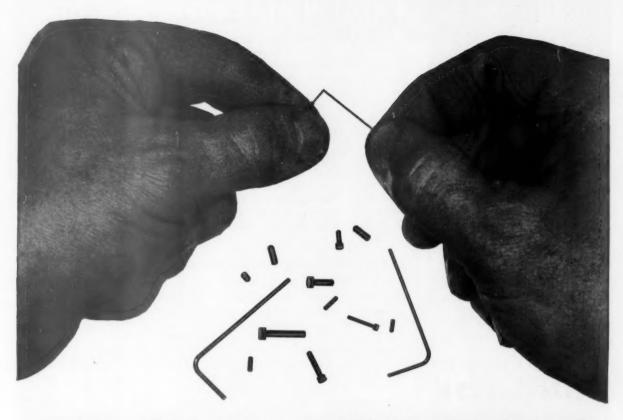
20,000 times increase in transmitter power over that required to contact the moon—a "clearly unreasonable power level." The extension in range could be accomplished by using a narrower bandwidth for the communication link. If one is willing to transmit more slowly, the bandwidth could be reduced proportionately.

To overcome the obstacle presented by earth's heavy atmos-

continued

LeTourneau's new scraper going through final testing. The \$100,000 Goliath moves 70 cubic yards of earth and when full, leaves auxiliary "pusher" machine (at left) to proceed under own power (600 hp Cummins diesel).





If you're miniaturizing . . . you'll save space, time and money with Allen Minicaps and Minisets (#0 thru #3 dia.)

These miniature Allen Hex Socket Cap and Set Screws will let you scale down your product sizes even farther. They're made from Allenoy special alloy steel—so strong that you can safely specify fewer screws or smaller sizes.

Allen Minicaps and Minisets are tiny, but very tough! — true Allens, with deep, clean, strong sockets and uniform Class 3A threads. Minicaps have the Allen knurled "Grip-Head" and are trimmed both on top and under the head, for tighter fit and better appearance. Minisets have the improved

small-cup Allenpoint that drives deeper and holds tighter.

Because sockets are uniformly true hexagon shape, the key or driver fits tight — makes starting much easier, saves a lot of time in assembly.

Diameters of these miniatures run from #0 through #3. Minicap lengths run from 1/8" through 1/2", and Miniset lengths from 1/16" through 1/4". Also standard in stainless steel. Your Industrial Distributor has them now. He'll show you why these Allens — like all Allens — hold tighter and last longer. Or write for information and samples.

Use Minicaps and Minisets wherever you need dependable fastening in very small assemblies:

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Sizes — 00 and up Qualified to MIL-F-18240

Long-Lok self-locking elements for all male threads hold fast against vibration — provide a seal against liquid leakage — just tap a hole and use Long-Lok, no inserts, safety wire or lock washers needed.

SAVE "\$" write today for free brochure and suggested applications.



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pheric and ionospheric curtain, a satellite could be positioned in

easy communication reach in a 300-mile orbit to relay messages.

TUBLESS TIRES FLAT? RUBBER RIVETS SEAL HOLES

A rubber rivet tubeless tire repair kit has been developed for trucks following more than 3 million passenger tire repairs in the last 16 months.

Fromberg rivets are contained in metal sleeves which are inserted into punctures with a gun. The sleeve is backed out, leaving the rivet "buttoned" inside and outside of casing. It forms a durable seal for the life of the tire, unaffecting tire balance and permitting later recapping. The rivet's expansion potential causes



it to expand and contract with the casing.

LARGE SCRAP PILE? INVESTIGATE SEAM WELDING

Annual savings on scrap metal, reclaimed through a new welding process, amount to \$70,000 on a single automobile stamping. The method involves welding odd-shaped off-fall into usable-size sheets on patented foil butt seam welding machines built by the Precision Welder and Flexopress Corp. of Cincinnati.

Foil welding permits smooth, non-overlapping seam welds of dense structure and high strength at speeds up to 24 feet per second.

One household appliance manufacturer, who scraps \$2 million annually, is working to produce mounting brackets by seam welding four pieces into single pieces. The automotive industry, which scraps up to 39% of all sheet metal used, is another prospect for large savings, Precision spokesmen report.

EPOXY RESIN-GLASS LAMINATE PROVES IMPACT STRENGTH



An epoxy resin-glass laminate withstood the direct impact of a 38 calibre, 158 grain bullet fired from 30 inches distance without surface penetration. The only result was a marking caused by lead in the cast bullet which was easily removed by wiping with a solvent.

The laminate, combining compounds made by the Houghton Laboratories, was made by wet layup. Built up to a thickness of 5/16", complete cure was attained in 24 hours at ordinary room temperature.

In the tooling industry, epoxys are used for making laminated tools, dies and fixtures, and in the electrical industry, for molds, transformer cores and high strength shells. Outstanding performance is also offered in the manufacture of chemical processing tanks and as adhesives for structural parts.



THE BEST INDUSTRIAL FASTENER FOR THE MONEY

Eliminate one work operation every time a nut-and-lock-washer is installed—and get the positive assurance of always having perfectly mated nuts and washers. No lock washers to put on—just start the nut, take up, and tighten. And Eaton Keps start quicker, easier, too—because the "funnel shape" literally guides the threads of the nut onto the bolt. The serrated washer spins freely, for perfect take up and tightening. Ideally suited for hopper feeding and automated assembly operations. In addition,

Eaton Keps give you uniformity piece-afterpiece, and unfailing dependable quality. Whether yours is a simple hand application

or a complex machine installation—you will do the job better, easier and faster at lower cost with Eaton Keps every time you put on a nut.

Send for literature describing Eaton Keps. No obligation.



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Unusual fasteners are everyday occurrences at Lamson. Some are fairly common; some are not even in existence when we get the order. But we produce each one with the same highly-developed engineering and manufacturing methods that keep costs low and quality at its optimum in Lamson's standard fastener products. Conversely, these same standards benefit from the skill and ingenuity derived in producing special items. These are reasons why you should look to Lamson for leadership in fasteners.

The Lamson & Sessions Co.

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Assembly and Fastening Ideas



"HARDWARE TRAIN" SAVES TIME, MONEY

Efficiency usually saves time and money.

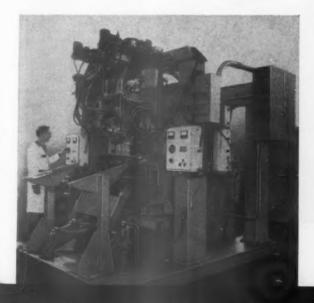
And Chance Vought Aircraft is turning the use of a simple "hardware train" into the saving of an estimated 15,720 man-hours a year in paper work and running around.

The train, a tractor pulling three trailers on which are built several hundred trays, supplies 5300 types of nuts, bolts, screws, washers, rivets and gaskets used to assemble F8U Crusaders and Regulus guided missiles in the Dallas, Tex., plant. With six trains in operation, over 40,000 requisitions a month are eliminated, among other space and traffic benefits.

Once a week the trailers are stocked and an IBM system is used to control reordering.

Each of the three trailers weighs about 4000 pounds loaded with hardware. A Mercury tractor is used to pull them on the nightly rounds of the plant. Daytimes, they are parked in assigned spots where employees can pick up needed hardware.





MAGNETIC TAPE TRACER AIDS ARC WELDING

A new magnetic tape tracer system that permits the joining of metal parts having untrimmed, out-oftolerance, straight line or contour weld line edges in a continuous automated welding operation has been developed by the Expert Die and Tool Company.

This system controls self-powered welding heads which automatically follow any type welding contour with a high degree of accuracy.

Machines built thus far have used the CO₂ are welding process; however, the basic tracer system is adaptable to any other arc welding process such as submerged arc or sigma welding.

This electronic system has been used for operations

continued

"WE REPLACE 9" BEARINGS IN LESS THAN AN HOUR... INSTEAD OF 3 TO 4 DAYS-AND SAVE \$155.00 EACH"

Says David B. Cook, Jr., President Acme Road Machinery Co., Inc. Frankfort, New York



"Replacing 9-inch bearings in the jaws of a giant rock crusher once required days to bore the housing and build up weld metal for reboring to a .0015" interference fit. Even then, placing the bearing took two men 3 or 4 hours.

Now, thanks to LOCTITE Liquid Sealant, we prepare the housing, clean and insert the bearing with a slip fit in less than one hour! Crusher jaw bearings locked in with LOCTITE have been in rugged service for many months without report of a single failure."

You, too, can eliminate interference fits. Loctive hardens between bearing and housing to form a bond that exceeds any interference fit . . . requires no heat or mixing.

Write for further information on money-saving LOCTITE applica-

tions in production or service . . . for slip fitting bearings, bushings, hardened sleeves and rotors on shafts; for locking threaded fasteners or studs securely; for sealing against high-pressure fluids.



LOGT TE SEALANT

AMERICAN SEALANTS COMPANY 135 Woodbine St., Hartford 6, Conn. In Canada: J. S. Parkes & Co., Ltd., Montreal on automobile wheels, frame siderail and crossmembers. Machines have been built for welding the two channel halves of right and and left hand automotive siderails and for welding automotive frame crossmembers.

Welding contour lines are followed by a mechanical probe mounted through a slide on the welding head carriage. The slide's movements are transmitted into a differential whose output represents the error between actual and design weld line. This displacement error is recorded on a loop of magnetic tape then picked up by a reading head which feeds the intelligence through a simple amplifier and hydraulic valve to a hydraulic servo cylinder. The cylinder corrects head position with respect to the welding carriage to correct for the error.

GIVE ASSEMBLY INSTRUCTIONS VIA DICTAPHONE

How often does an engineer say: "Oh, no, not another trip to the assembly line. When are those guys going to remember how to put this thing together?"

Now, from his desk, he can personally direct step-by-step assembly operation, thanks to a new method of providing taped instructions.



AIMO (Audio Instructed Manufacturing Operation) was developed by Dictaphone and tested at the Westinghouse East Pittsburgh plant, where it contributed to a dramatic increase in productivity and cut down worker fatigue markedly.

Two machines are used—one to record messages on magnetic tape, one to receive them. Unique is the feature which allows the instructor to clearly define consecutive blocks of data and permits the assembler to play back these specific areas as often as desired.

Depending on the needs, three types of receiving units are available: standard head-set, loudspeaker and a cigarette-lighter sized portable unit similar in use to hearing aids.

Total price: from \$1700 to \$2000.



NEW REACTOR CUTS COST, EXTENDS USE OF CO. WELDING

Research by Westinghouse into the electromechanics of weld metal transfer in gas-shielded welding processes has led to a new type of power supply equipment that will bring the advantages of Co₂ welding to many new industrial applications. Suitable for use with any standard constant-potential, constant-wirespeed system of metallic-inert gas welding, the new "Dynamic Reactors" are compact, static, two-terminal packages that are



connected in series with either of the welding current leads; physically, the units can be placed near the welding machine or near the work.

By limiting the rate of rise of weld current, the new reactors permit the use of lower weld currents and the transfer of weld metal in droplet form which, in turn, allow the use of larger and less expensive wire sizes, effective depth control of weld penetration

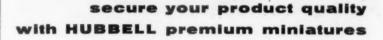
and, for the first time, the use

of the CO₂ process for vertical and overhead welding.

Pilot equipment already operating—principally in the automotive industry—is in use for automatic and semiautomatic welding of mild steel but the process is equally applicable to stainless steel, aluminum, and nonferrous alloys.

Applied to automatic and semiautomatic welding equipment, the reactor makes it possible to reduce minimum welding current by a factor of more than two to





Here are the "tremendous trifles" upon which product quality depends. Hubbell miniature screws assure efficiency in your assembly operations, dependable product operation and long term product life and user satisfaction.

Hubbell miniatures are the finest obtainable. They are available in sizes #0 and #1 in steel, stainless steel or brass; and in head styles and sizes to meet your most exacting needs.

Hubbell quality can be your greatest production economy. If you have a special problem . . . call Machine Screw Department, Bridgeport, EDison 3-1181.



New plastic "see through" boxes permit screw identification or inspection without opening the box.

Pressure-sensitive labels provide convenient identification by size and type; reseal the bex securely after

Signey "showcase" heres stack easily, take up less room or sterage thelves or work counters.



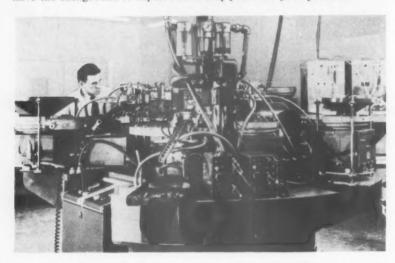
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YEARS'
EXPERIENCE
In the manufacture of
highest quality, rolled
thread machine scrows
and special
cold headed parts.

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ASSEMBLING SMALL PARTS YOUR PROBLEM?

Whether your needs call for a complex, indexing multistation assembly machine, a simple two- or three-station assembler or just an individual tool or feeder for an existing machine or line, Sperry Multra Engineers have the background of experience to help you solve your problem.



A typical 16-station Multra unit provides a complete selfcontained production line for automatic assembly of small parts. Its exceptional versatility and adaptability make it ideal for operations such as inserting, crimping, screw-driving, welding, riveting, staking and many others used in the assembly of a wide variety of electrical, electronic and mechanical products.



SINGLE STATIONS FOR ESTABLISHED PRODUCTION LINES

Design of individual tool stations custom-built into established lines are another feature of the outstanding engineering service offered by Multra.



MULTRA FEEDERS CUSTOM-DESIGNED FOR ANY OPERATION

Feeders are vitally important in the efficient operation of any automatic assembly system. Feeding problems have long been a specialized study of Multra engineers.

Whether you need a complex system for a multistation line or a straight forward system for a single stage, Multra can design and engineer the complete job ready to operate in full production. If you have any problems involving automatic assembly, call or write us today.

Multra Automatic Assembly Machines

SPERRY PRODUCTS, INC.

Danbury, Conn. Use postpoid card. Circle No. 217



Assembly Ideas, continued

one. In a typical process 1/16"-diameter wire, minimum current can be reduced from the conventional value of 300 amperes to about 100 amperes, with negligible spatter and the ability to weld in any position.

In existing applications, savings in wire costs will usually be significant since direct substitution of wire at least one size larger is possible with little or no change in current, voltage, and travel speed. Reductions in weld current ranges will also give the CO2 process the ability to join thinner metal than formerly was practical. Where weld penetration depth once limited the process to 1/8" material (with a copper back-up plate), the new technique permits butt welds without back-up plate on .040" material with electrodes of the same size as used for .125" material.

SELECTIVE PLATING ALLOWS SOLDERING WITHOUT FLUX



A new production technique allows aneroid elements of barometers, altimeters, depth gages and other pressure-sensitive devices to be soldered without flux. Selective plating eliminates the chance of leaving corrosive material inside the diaphragm.

Usually, the oxide film on heattreated diaphragms is ground or lapped off and the edges then tinned for soldering. The Dallic Meta-chemical Ltd. method is to deoxidize electrolytically and rinse diaphragms, then plate the mating surfaces with a flash of tin, or tin-lead alloy, to permit soldering without flux. A second method eliminates both flux and manual soldering. After cleaning, .0005" of tin is deposited on each contact edge. Clamped diaphragms are routed through a controlled atmosphere oven at 500° F where five minutes achieves a strong, leak-proof diffusion seal.

ULTRASONICS SPOTWELDS ALL METALS—NO FUSION



The knotty problem of joining dissimilar metals without fusion or external deformation is being resolved by ultrasonic spotwelding, a method developed by Aeroprojects Inc. of West Chester, Pa.

Newest in the Sonoweld line is a 2000-watt machine which subjects materials to be joined to high frequency alternating vibrations, generated by the transducer in the welding head system and transmitted through the coupling members to the work being done. It is applicable to both similar and dissimilar metals. Thicknesses to .050" of 1100-H aluminum and .025" 316 stainless steel have been bonded together, as well as copper, nickel, molybdenum, tantalum and niobium.

The process features simplicity of operation—work to be welded is placed between two sonotrodes and automatically welded by activating a foot switch—and speed, for there is no prior metal cleaning needed. The process reports up to 95% reduction in electrical power required over standard resistance welding. It consumes a maximum of 3.5 KVA of power.



The <u>RIGHT</u> rivet, plus the <u>RIGHT</u> riveting machine will produce a fastened assembly at the <u>RIGHT</u> low cost

The correct combination of rivet and machine requires expert knowledge available to you through Chicago Rivet engineers.

Anticipated production, type of materials to be fastened, assembly shape and its expected service life are factors to be considered. Decisions must be made on a rivet metal or alloy. Type and size of rivet, shape of head and shank, depth of tubular section must be all determined. Are indexing fixtures and multiple setters indicated? Can a standard rather than a special rivet be used? These are the type of questions Chicago Rivet Engineers are daily answering for industry. Their recommendations are available to you without cost. We suggest you send a blueprint or sample assembly with your inquiry.

There are
Chicago Rivet
Machines that will set

1]
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Tubular or Split
Rivets At a Time

Chicago Rivet & MACHINE CO.

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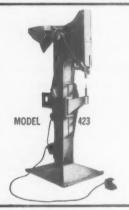
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Rivet catalog describing 1388 standard tubular and split rivets
and 26 single and
multiple automatic
rivet setters.



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CUT ASSEMBLY COSTS...

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Milford Rivet-Setting Machines
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assembly problem. Count on
Milford's versatility and ability
to come up with the right answers
at substantial cost savings.
To take full advantage of
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THE MILFORD

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SUPER-ALLOY "DOGLEG" BRACKET RESISTS 15,000 LBS. ENGINE THRUST



Brackets tie down the engine on the fastest and highest flying interceptor.

Trying to tie down 10,000 and 15,000 pounds thrust is a rugged job, but Convair is doing it with three small brackets made from an alloy called A-286.

The special "dog-leg" bracket holds the engine of the new F-106A Delta Dart with a J-75 engine, 15,000 pounds thrust and the F-102A which has a J-57 engine and a 10,000 pounds thrust.

Allegheny Ludlum Steel developed the superalloy noted for its corrosion-resistance, heat resistance and strength at elevated temperatures.

AUTOMATIC SPOTWELDER SPEEDS REFRIGERATOR PRODUCTION

Around the world in 180 days.

That's how often and how much steel wire a production-speeding resistance welder processes at the Westinghouse refrigerator plant in Columbus, Ohio.

The machine does the delicate job of spotwelding condenser tubing to a wire frame which holds the tubing to the back of the appliance This replaces the former method of attaching the tubing to heavier sheet metal.

Some 168 strands of J&L .0475 wire are fed into the welder simultaneously and joined above and below the pre-formed, continuous copper-coated steel tubing, then cut to length before discharge. Wire is drawn in from top and bottom to form "mats" of four lengths—22, 30, 38 and 42 inches—the smallest for oil coolers and largest for freezers.





Like a giant loom, steel wire is drawn into resistance welder from top and bottom, as operator feeds in the frames to which the wire is spotwelded. The result, says Westinghouse, is a lighter, better performing refrigerator condenser.

speedy fastener service

RIVETS · NAILS THREADED PARTS

In Between Sixes • Lengths to 7 Inches • Close Tolerances • Special Heads • Any Metal including Monel • Inconel • Stainless

FAST DELIVERY... SHORT or LONG RUNS... DESIGN ASSISTANCE

Over 250 wire sizes in stock—from .024" up to 36" diameter—in 30 alloys . . . all geared to meet your requirements quickly to our usual high quality standards.

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Reports from the Field, continued

Four welding heads weld the upper and lower wires to two tubes at a time, the conveyor indexing four inches at each stroke. For larger mats, extra dies are added to make the welding heads larger. The heads are operated by air pressure and are individually equalized to maintain uniform

pressure. Gear ratios in the machine are changed according to the size of the wire mat being produced.

Each condenser is subjected to a 225 lb air pressure test to check, in part, the strength of the welds. The machine is made by the Resistance Welder Corp.

LIQUID SEALANT LOCKS ENGINE PIPE PLUGS UP TO 800 PSI

Over 20 pipe plugs in the fuel control for jet engines made by Hamilton Standard Div. of the United Aircraft Corp., Winsor



Locks, Conn., are sealed and locked with a liquid sealant called Loctite. The plugs, ranging from ½" to 3/16" in diameter, are sealed against JP-4 fuel at pressures as high as 800 psi and resist loosening from vibration and shock.

The sealant has consistency of a light penetrating oil and hardens only when confined between closely fitting metal parts and in the absence of air. It hardens with a shrinkage of less than 5%, filling all voids in the joint.

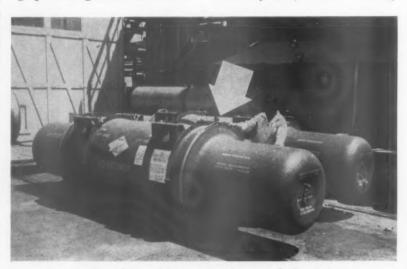
QUICK-RELEASE COUPLINGS SEAL FLIGHT REFUEL TANKS

V-band couplings were chosen by the Harbor Boat Building Co. to meet rigid Navy specifications for pressurized fiberglass containers to hold refueling units to convert fighters and bombers into aerial tankers.

The containers called for a design permitting instant disconnec-

tion of the section (allowing the planes to revert to normal combat functions), perfect sealing at the joints to maintain pressure and minimum over-all weight.

Marman Aeroquip V-band couplings feature an over-center toggle latch which provided the necessary seal, release instantly



Connecting couplings designed for instant release on fuel containers.

without removal of heavy nuts and bolts and keep weight within application requirements.

HOW TO FASHION, FASTEN DURABLE, ATTRACTIVE LEGS

The durability and design of legs—furniture legs, that is—is the assembly and fastening concern of the O. Ames Co. of Parkersburg, W. Va. And here is their practice.



Federal spotwelder joining an insert to the leg of household furniture.

Legs being fastened to supporting member with Rotor power tool.



Instead of fitting metal kitchen chairs, step stools and high chairs with standard steel tubing legs, this manufacturer starts with J & L cold rolled steel. The .041 gage by 21" steel sheet is blanked and tapered, then trimmed and punched, crimped (U-formed) and rounded. A reinforcing insert is spotwelded in, after which the leg is drilled and tapped at the insert to receive the support member screw at time of assembly.

The legs are painted or chromeplated and finally buffed and polished. Special attention is given to design: integrating the legs with seat and back to make a solid total unit, fastening the legs to the supporting member under tension to make the unit strong and wobble-

ontinued



The new Townsend Versa-Lockbolt* is an improved, yet more economical type. Design changes have increased the grip range of the fasteners and make it feasible to use them in relatively oversized holes. They are more economical to manufacture and the savings are passed on to you.

The high tensile pre-load values and positive locking action which have made lockbolted joints absolutely vibration-proof in the past are also provided by the Versa-Lockbolts. The new flanged integral washer-collars make Versa-Lockbolts especially suitable for fastening even light gage materials.

The wider grip ranges provided by additional locking grooves in the Versa-Lockbolt permit a reduction in the sizes stocked, reducing inventory costs and increasing production line flexibility. Installation inspection is reduced, since hole sizes are less critical. These savings, plus the lower cost of the fasteners make Versa-Lockbolts a truly economical method of vibration-proof fastening.

For full information, write Townsend Company, P. O. Box 237-U, New Brighton, Pa.

*Licensed under Nuck patents RE 22,782; 2,114,483; 2,527,307; 2,531,048; 2,531,049 and 2,754,703

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NEW TYPE FEED TRACK AND ESCAPEMENT MECHANISM

- Flexibility for easy and fast adjustment
- Escapement does not require daily lubrication
- Escapement design permits releasing screws by body or head as required
- Positive solenoid action
- Simple design for easy servicing
- Adjustable for full capacity of machine

Write for NEW BROCHURE!

DETROIT POWER SCREWDRIVER CO.

tained Driving Head

for use in specially designed assembly

2821 W. FORT STREET

DETROIT 16, MICHIGAN

Field Reports, continued

proof. An added feature of the legs is the absence of protruding boltheads.

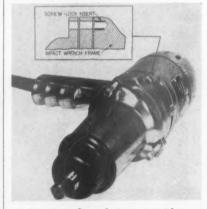
ADHESIVE BONDS PAPER TO METAL AUTOMATICALLY



A rapid drying, short tack range adhesive has helped make possible the automatic process of bonding paper to formed aluminum strips in the production of corner beads for dry wall construction at Beadex Corp., Seattle, Wash.

The adhesive, designated as EC-1099 by the Minnesota Mining & Mfg. Co., is automatically applied to the paper by a special applicator. The paper is then guided through a series of pulleys until the adhesive has become sufficiently dry for proper bonding.

SELF-LOCKING INSERTS EASE WRENCH ASSEMBLY



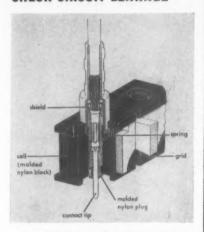
A wire thread insert with an integral self-locking feature has reduced maintenance costs and simplified assembly of a new ½" drive heavy-duty impact wrench manufactured by the Millers Falls

Co., of Greenfield, Massachusetts.

The Heli-Coil insert eliminates the need for lock washers or other vibration-resistant locking devices in joining the aluminum die cast housing and frame, checks thread wear and protects against thread stripping caused by accidental over-torquing of the screws in assembly.

The 2000-impact-per-minute wrench uses three 10-32 x 1-1/8" socket head machine screws that join the cover to frame and stainless steel wire thread inserts. After tapping the bolt holes, the insert is threaded with a tool into place. It has an ultimate strength of about 200,000 psi.

MOLDED NYLON CELLS CHECK CIRCUIT LEAKAGE



A cellular construction using molded nylon blocks has been developed by American Marsh Pump, Inc., Harrisburg, Pa., to prevent current leakage between circuits on shielded patchwork systems designed for computers and test, processing and business machines.

The blocks, and nylon plugs for removable patchcords, made by Gries Reproducer, are constructed with alternating metal strips, forming cells which prevent seepage. Each block has a molded-in hole, fitting all standard, coaxial or special shielded patchcords. The success of the "mating sleeve" depends on nylon's property of "elastic memory" which enables the inserted plug and lead wires to be pulled out without the hole losing its original dimensions, thus retaining its "locking" action.

A SIMPLE VALUE
ANALYSIS SESSION
IN YOUR PLANT
WILL SHOW YOU HOW
COLD HEADING

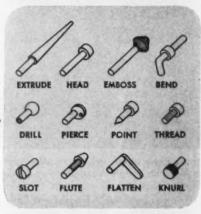


CUTS FIRST COSTS OVER MACHINING



TO DO THESE

(AMONG OTHER THINGS)



TO CUT ASSEMBLY COSTS, TOO.....



Purchasing and engineering people can profit from a brief demonstration staged by Progressive cold upset experts. Special fasteners and small parts you now use or contemplate using are analyzed for adaptability to cold heading.

Please write today, asking for a Cold Upset Analysis Session. Or outline your problem to us and we will promptly mail examples of first cost and assembly savings gained by parts produced by Progressive.

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d

Driver sets screws which hold slide rails to plastic plate of coffee brewer assembly. Gage clamp locks the rails in proper position.



Parts of new plastic brewer chamber go together easily with single take-down cap and self-aligning gasket.



Thumb screws can be run up easily with fingers. These screws do not penetrate chamber walls, avoiding contact with coffee.



MEETS HEALTH CODE

Ingenuity and creative thinking resulting from compliance with health codes has resulted in a great savings in the assembly of new fresh coffee vending machine at the Bert Mills Corporation.



by Darrell Ward, Field Editor

Certain regulations imposed on a manufacturer actually can become assets more than liabilities, if one can view the situation with the proper attitude. That the belief of Bert Mills, whose company of the same name makes automatic Fresh Brew coffee vending machines in St. Charles, Illinois. Mr. Mills welcomes the many problems continually introduced by various health departments to the vending machine industry. He believes that such regulations are basically good, if they have a logical reason for existing.

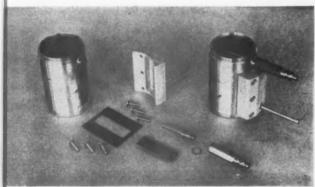
"Besides making things better and healthier for the consumer, these things benefit us in the long run," he philosophies. "If we have a multiplicity of strict codes to follow and can pass all health department codes in the United States, it is better for us, once we do pass, and a lot tougher for our competitors to keep up."

INFLUENCE OF CODES ON PRODUCT ASSEMBLY

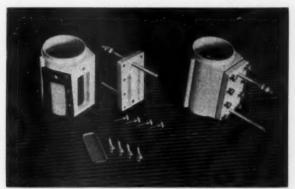
What influence do health codes have over coffee machine assemblies?

"More influence than most engineers would care to think about," Mr. Mills told us. "In any kind of food vending machine, every part exposed to food must be removable by hand for cleaning."

CUTS ASSEMBLY COSTS



Old style stainless brew chamber and breakdown of parts. Injector spray jet consists of two specially-machined tubular parts with washer seal mounted in separate hole.



New type plastic brewer chamber with breakdown of parts showing injector spray tube and outlet tube as integral parts of cap. Note simplified flat-faced cap.

"This code, originally set up by the U. D. Department of Health to cover all machines used by the Armed Forces, sets a precedent for most local health departments. Local health authorities usually won't pass a machine unless it will pass the Federal code."

Then, modern sanitation requirements must make fasteners a problem?

"Complying with the code is not easy. Our efforts to do so often turn up a number of interesting and different kinds of fastener problems. Two such problems stem from the same basic regulation.

"The first problem is that parts, which contact food and which must be frequently taken out for cleaning, must be removed by hand. Even simple tools such as pliers or screw drivers are not permitted to be used by service personnel during routine cleaning and servicing.

"The second problem is that no sharp edges, corners or grooves can be exposed to food material because such recesses may accumulate bacteria and cannot be cleaned readily by routine service techniques. That eliminates standard American "V" threads on screws which penetrate the wall of any container. It also tightens up the spe-

cifications for machining, shaping and assembling any such parts.

USE WING NUTS AND KNURLED HEAD SCREWS

How can parts be assembled and knocked down by hand and still provide sufficient pressure to seal containers used for liquids?

"We use wing nuts instead of hexagon, and knurled head screws instead of other standard patterns. The fastener must be designed so that the fingers can develop sufficient torque and locking action in assembly so that the vibration of the machine will not loosen the parts in service. At the same time, the fastener must be removed easily by finger pressure when the service man makes his rounds to replenish supplies and clean up all parts in contact with food."

Mills engineers had numerous problems in working out the present fastener arrangement in the fresh coffee brewer unit. At first the brewer chamber was designed of stainless steel. This chamber is automatically sealed with sliding pressure plates at top and bottom after the coffee grounds, enough to make ten cups, are metered into it for one brewing. After the plates slide shut

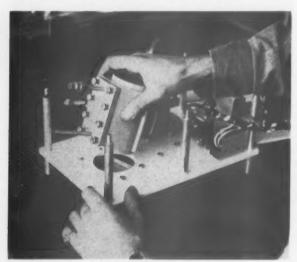
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Assembly of Vending Machines, continued

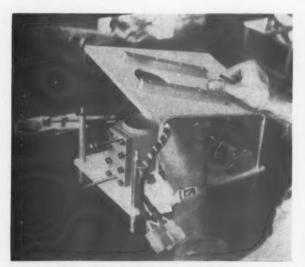
and become seated, a jet sprays 200 F water through these grounds in the chamber and out through a fine mesh screen to the discharge tube.

The brewer outlet cap, fastened to the side of the brew chamber, is a metal block machined to provide for the screen and discharge tube. The block is secured to the brew chamber shell with six machine screws. Because of the thinness of the stainless steel, the screws had to penetrate the shell wall of the brew chamber, and, therefore, were exposed to the liquid coffee during the brew cycle.

Since no sharp edges, corners or grooves were permitted, the screws had to be of a special pattern, like the English Whitworth screw thread which is rounded at the outside and root diameters.



New brewer chamber slips right into place with close tolerance plastic-to-plastic fit for easy assembly or for servicing after installation.



The top slide plate goes on the mounting studs after the electrical assembly, cams and brewer chamber are in place.

The problem—who made such a thread on standard stock items.

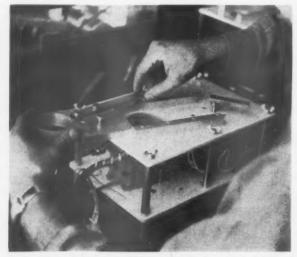
The engineers sent out inquiries to every supplier they could find listed. No one seemed to have such a thread in stock. Anyone could make it on special order, but who would stand the cost of special tooling?

The only screws available at a reasonable cost were made by British manufacturers. Bert Mills did not want to import these special screws and then depend on this source as a standard supplier. The only thing to do was to order special screws from a U.S. supplier who could make the best bid on the job. This move was initiated in order to comply with health regulations and to avoid costly delays in production of the new Fresh Brew machine.

But, Mills engineers don't usually look for only



Wing nuts are used in locking top plate because all parts in contact with food must be easily assembled or taken down for cleaning without use of tools.



Last step is positioning slide seal in rails and then fastening the connecting rod to the cam arm with knurled head screw.



Designers and Manufacturers of the World's Finest Precision Fasteners

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of design and production problems. The design features of this item, when installed, provide tremendous resistance to axial and radial displacement (push-out

teristic. These materials may be in the form of sheets, extrusions or

Other Features: Available in a full range of sizes.
#2 through %". The internal thread locking feature to MIL-N-25027
(ASG) is an optional feature. Additional configurations of the Press Nut are available. Contact Rosan

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Assembly of Vending Machines, continued

one way to solve a problem. And in this case they had plenty of incentive. The sanitary screw thread was not the only factor to consider. There were such things as the high cost of producing close tolerance, specially-machined stainless steel tubing. The tubing was economical enough, but the machining ran into several dollars for each part. This only added to the high cost of sanitary screws to be applied to the expensive chamber, once it was machined. Basically, the high cost of sanitation was getting out of hand.

BEATING THE HIGH COST OF SANITATION

The engineers diverted their attention to plastics at about the same time the screw problem was being solved. That is why the present model brew chamber is made of melamine at about one-tenth the cost of the stainless. And, by incorporating modifications in the molded design of the newer chamber, the filter screen seats better in a rounded-corner recess, the wall thickness is much greater, and the improved cap is mounted with knurled head cap screws which do not penetrate the brew chamber wall. The large knurled heads permit easy removal by hand.

Thus, two problems were solved at once. Special screws for sanitary contact with food were eliminated. And, screws formerly requiring a screw driver for assembly could now be assembled or removed by hand. Both features were great improvements toward meeting code requirements.

BENEFITTING FROM RIGID REQUIREMENTS

These problems came up as objections from the Chicago Board of Health when they were passing on the newly-designed coffee brewer unit some time ago. But instead of complaining about the rigid requirements Mr. Mills said that the situation actually was very beneficial to his company in the long run. Compliance with the sanitary code forced him to help himself.

Why? Because the sanitary problem was not the only one solved. The ingenuity or creative thinking done by the engineers when they faced the pressure of supply and cost on necessary parts led to an entirely different kind of part—the plastic chamber. All because of a simple screw which could not be made as simple as mechanical needs would permit, the part was radically changed in both design and materials. This resulted in a great savings of the original cost, and is also proving to be somewhat more economical to assemble in the plant.

Coffee brewer assembly slips into position to make snug-looking package, but each component or sub-assembly can be removed in seconds for clean-up, repair or replacement on location.

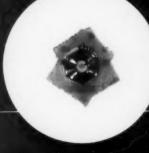
Here is a completed Fresh Brew coffee vendor. Metal cabinet comes in different colors with matching trim.

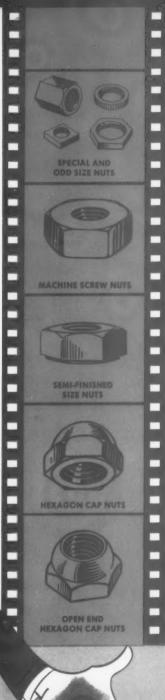




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This is precision







and this is the story of

"Fischer Turned"

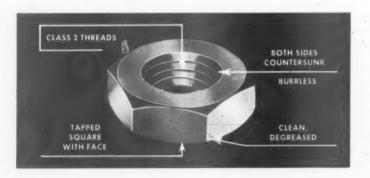
BRASS AND ALUMINUM NUTS

All nuts are *not* the same. The Fischer nut below is a precision product in spite of its thinness.

Like all Fischer brass and aluminum nuts . . . standards or "specials" . . . it was produced by turning on unique high-speed machinery. This process gives Fischer nuts an accuracy and uniformity which speed assembly operations and cut costs through faster starting . . . smoother, easier running . . . superior bearing surfaces . . . elimination of "blanks" or rejects.

Yet you pay no premium for this extra quality . . . Fischer precision-turned nuts cost no more than those produced by other, less accurate methods.

Specify "Fischer" on your next order. Prompt delivery is assured by large stocks of all standard types and sizes . . . "specials" are produced quickly and economically.





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WELDING PRECISION COMPONENTS



Sector assembly is positioned on locator ring for welding in press-type machine.



Hot heading studs to plate on welding setup assures that studs retain size and location.

Resistance welding and hot heading are used by Victor Adding Machine where precision assemblies are a necessity.

One of the problems confronting the Victor Adding Machine Company, of Chicago, in the production of parts for a sector assembly was to maintain thickness while assuring a strong component.

The former method consisted of placing a bushing in a bench-press fixture, then placing a large gear and a small gear on the bushing, then come down with a staking tool to bend four pronged projections down to hold the assembly together.

The thickness of the cold rolled steel components—.115 inch, plus-minus .0035—was very critical to the function of the assembly. And as company policy was to continually strive for a better product, requiring less maintenance, a better method of assembly for this particular part was needed.

Resistance welding was chosen as the new process. A Peer press-type welder was procured. The upper electrode of the welding head is hard copper and flat-faced. It is actuated by a double-acting air cylinder mounted on a quill-type housing.

With the change in the production process, a washer was added to the sector assembly and a taper added to the shoulder of the bushing. During the welding process, the washer contacts the shoulder at mid-height to the taper. It is at this contact point that the heat is intensified to make the weld.

The weld timer synchronizes the amount of current going to the welding head. When the material gets plastic, it bulges into the space below equally on the whole periphery, thus centering the small sector gear. Just as the weld timer controls the increase in current prior to the weld period, it controls the annealing phase after the weld period, reducing brittleness surrounding the weld.

The rate of 312 welded assemblies per hour is comparable to the staking method. However, the welding method solves Victor's requirements regarding dimensions and a stronger assembly.

continued



Save Money

by simplifying fastener design

Here is a simple application of a basic bolt making principle which is affecting substantial savings for a number of manufacturers.

These savings, resulting from simplified design, are realized in every step of the operation from lower first cost of the fasteners through inventory to final assembly. Totalled, they are well worth while.

There are many other basic principles ... often overlooked in designing and specifying fasteners, which are of importance cost-wise.

> You'll find them in our new booklet, "How to specify fasteners ... and save". Filled with drawings and charts, it makes a handy guide in designing or buying any headed parts.

> > If you can use a copy, write to North Tonawanda or ask a Field Representative.



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CENTRAL OFFICE North Tonawanda JAckson 2400 (Buffalo) Welding Small Parts, continued

Another precise operation is fastening studs to the cam or linkage in a calculating machine assembly. It is critical that the studs retain size and location. Victor uses some 30 different size of studs in various assemblies. Some must be below the surface in countersunk holes; others may be above the surface of the plate.

Studs are made of cold rolled steel, hardened to 62-65 Rc. Previously, the studs were joined to the linkage by riveting, but sometimes the hardened material was shattered, causing the studs to loosen with vibration.

The method of fastening the studs to various parts, that is working out effectively, is to forge or hot-head the studs on a resistance welding set-up. The upper electrode resembles a spot welding electrode. The lower electrode is recessed to take the lower body of the stud.

While the fastening end of the stud is brought up to forging heat by passing current between the electrodes, the body of the stud is kept cool by the water-cooled lower electrode.

When hot-headed, the hardened material of the fastening end becomes plastic and fills the hole without destroying the structure of the stud body.

Victor is not shooting for quantity as much as quality in this operation. The production rate is the same as for the riveting method-400 to 600 pieces per hour.



Sure, I said that chuck was designed for tapping heads, but . . ."



Screws on the floor mean trouble at your door! Ordinary fasteners when used in the assembly of thin gage metal sheets, often spin or slip—result in work stoppages, salvaging operations, higher production costs.

Now you can substantially reduce waste motion, rejects and lost time, with Parker-Kalon's new "Hi-thred" Self-tapping Screw . . . the new fastener that grips securely without spinning or slipping . . . even in very thin gage metal sheets.

Developed by P-K's research team, the revolutionary "Hi-thred" is threaded full to the head—with the last thread actually terminating in an annular orifice in the head itself!

For samples, see your nearby Industrial Distributor. "Hi-thred" fasteners are available in production quantities at no increase in price in Types "A" and "Z" in non-countersunk head styles, in either Slotted or Phillips Recessed Heads.

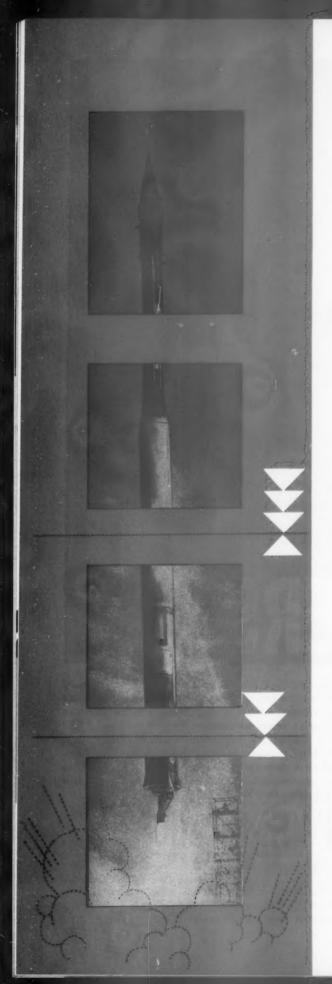


PARKER-KALON° "Hi-thred"

Self-tapping Screws

Sold everywhere through leading Industrial Supply Distributors

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, New Jersey
Use postpoid cord. Circle No. 226





by **José Rosán, Sr.** President Rosán, Inc.

FASTENERS IN THE SPACE AGE

New fasteners with special features, and intended to withstand the temperature, stress and vibration demands of space age vehicles will eventually become standard catalog items

Many of the old methods of fastening have become obsolete with the advent of the air and space age. Many fasteners of traditional design on the market today were never intended to withstand the temperature, stress, and vibration demands of the space age vehicles.

The modern fastener manufacturer is designing special feature fasteners to solve these problems, and will eventually carry such special fasteners as standard catalog items. The demand for such special fasteners will increase directly in proportion to vehicle and unit assembly advancements. A careful examination of the variety of special fasteners—designed to meet today's needs and anticipating tomorrow's requirements—will reveal that a positive locking concept is in evidence.

Fasteners incorporating positive locking are largely of a patented or a proprietary nature. This is due to the great expenditures in time, effort and experimental costs in producing fasteners of such design by the manufacturer. It is this proprietary interest in these special fasteners that gives rise to the reluctance of many manufacturers to use such items when supplying to the government. Some manufacturers feel that the government is not anxious to use patented fasteners even though the government (through the U.S. Patent Office) has set up incentives to inventors and manufacturers to design and develop new ideas that would help the government directly or indirectly. Governmental procurement agencies are sometimes reluctant to specify patented fasteners even when they are the best for the job.

Fasteners, and especially those of the threaded type, have had a long, hard pull against disinterest and lack of perception relative to the position of the fastener as a major consideration and element in any mechanical assembly. The space age vehicle has emphasized the importance of the correct fastener in critical assemblies. The functional dependability and service-ability of an assembly, in the last analysis, is only as good as its fastenings.

Unfortunately many buyers are under the impression that all fasteners are simple hardware items, not too important, and should be bought at the lowest possible price. It should be remem-



". . . . fasteners designed to meet today's needs and anticipating tomorrow's requirements."



"Some manufacturers feel that the government is not anxious to use patented fasteners"

bered that the initial cost of the fastener is invariably a meager part of an assembly's total cost, and may be less than the cost of one machining operation on a detail. Illogical cost scrimping on fasteners can and has resulted in the malfunction and destruction of costly assemblies. With the cost per unit of many of our missiles in the hundreds of thousands of dollars' category, failure and possible ultimate destruction, due to failing of a fastener, points to the care and judgment that must be exercised in drawing up specifications for fastenings. Specialized fasteners, produced as standard items, are rapidly replacing conventional fasteners, many of which were developed years ago and will not meet today's space age requirements.

Let us follow the life cycle of an old type special fastener:

A. Some years ago an inventor or company developed a new special fastener for installation in certain specific materials to solve a problem in regard to tension and torque.

B. It was approved for use. A MIL specification or an AN standard was issued.

C. Through the years new materials have been used, resulting in new problems of tension, torque, temperature changes, material hardness, etc.,

continued

Fasteners in the Space Age, continued

causing this fastener to fail because it will not be designed for these conditions. Yet, companies and government agencies will continue to use this fastener because:

- 1. It is easily obtainable from a standard sheet.
- 2. It is a non-proprietary item.

Little or no consideration is given the following: a. How this fastener meets the specific problems involved in our modern engineering of the

- space age. b. Its safety values.
- c. How this fastener fits into our high-speed installation methods on the production line.
- d. The problems involved in service to replace this fastener.
- e. Special tools for replacement or removal that may be required.
- f. What the true cost of this fastener is when you consider: manual tools vs. power tools; skilled vs. semi-skilled operators; cumbersome inspection vs. no inspection requirement; selection of mating parts for assembly vs. straight assembly; and elimination of over-size and undersize parts on the assembly line.

Engineering research and development is advancing at tremendous speeds. As a result, new and improved fasteners designed specifically to solve special problems are offered to industry each day.

It is well to remember when dealing with space age vehicles and their special requirements that:

A. Many fasteners cannot be used from a hardware box like a bolt and a nut.



"Just any old nut won't do."



"Illogical cost scrimping. . . ."

B. Standard sheets furnish basic dimensional data in regard to a fastener, but it must be clearly defined that a fastener cannot be promiscuously used. Its success will depend entirely on its installation and the conditions under which it has

C. Many months are required to get approval of a new fastener from a government agency.

D. It requires many years for a fastener to become an Army and Navy standard.

E. During the years it takes for a part to become an Army and Navy standard, new parts are developed which are superior to the part being made on an AN standard, but the new part must go through its waiting period before it can be accepted.

UTILIZING ENGINEERING ADVANCEMENTS

In order for manufacturers to more fully utilize engineering advancements in fasteners, we must have:

A. Acceptance by the government for its use of both proprietary and non-proprietary fasteners.

B. Fastener standard sheets must provide more detailed information for the designer so he can use such information as a guide for new designs, or discard its use as being inadequate for the purpose, and then use custom-made fastenings.

C. Testing of fasteners for the immediate purpose and certified laboratory evaluation for submission to the proper government agency or

D. Approval by the government agency for the specific purpose or use tested for (based on such test report submitted above).

E. Evaluation of any fastener to be used should be made on the basis of its production installation, time and cost.

Waldes Truarc Prong-Lock Ring Eliminates Springs, Washers, Takes Up End-Play

WALDES TRUARC SERIES 5139 RETAINING RING*

application: external for shafts range: 3/32" through 7/16"

*U. S. Pat. No. 2.755,698

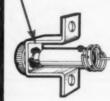


Rings replace cotter pins, spring-washers; save \$6800/M

Mason-Neilan Division of Worthington Corp., Norwood, Mass., uses two Waldes Truarc Series 5139 Prong-Lock rings on its pressure controller to secure pivots through which a right angle micrometer adjustment screw passes. Each ring replaces hairpin-type cotter pin and bowed washer.. provides necessary tension to prevent adjustment screw from shifting. Manufacturing costs were reduced by \$68 per 1,000 units. After radial application, the Waldes Truarc Prong-Lock retaining ring locks and holds securely in its groove by means of two prongs. Because of its resistance to radial displacement, the ring may be used as a shoulder for rotating parts. Thrust-load capacity ranges from 80 to 700 lbs. for sizes from 3/32" to 7/16". Bowed construction provides end-play take-up, often eliminating springs, washers and accessory devices.

Ring replaces locknut, eases control

On a differential pressure control mechanism, Taylor Instrument Companies, Rochester, N. Y., replaced a locknut and eliminated a costly threading operation with a series 5139 Prong-Lock ring. Also eliminated is the loosening and tightening of the locknut before and after each calibration setting. Spring action of the ring securely holds the calibration setting.



Whatever you make, there's a Waldes Truarc Ring designed to save you material, machining and labor costs, and to improve the functioning of your product.

In Truarc, you get:

Statistically Controlled Quality from engineering and raw materials to the finished product. Every step in manufacture watched and checked in Waldes' own modern plant.

Complete Selection: 36 functionally different types. As many as 97 standard sizes within a ring type. 5 metal specifications and 14 different finishes. All types available

quickly from leading OEM distributors in 90 stocking points throughout the U. S. and Canada.

Field Engineering Service: More than 30 engineeringminded factory representatives and 700 field men are at your call.

Design and Engineering Service not only helps you select the proper type of ring for your purpose, but also helps you use it most efficiently. Send us your blueprints today... let our Truarc engineers help you solve design, assembly and production problems... without obligation.



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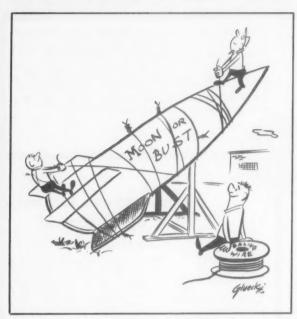
Use postpaid card. Circle No. 227

@1958 Waldes Kohinoor, Inc.

Fasteners in the Space Age, continued

F. Built-in design features that will make the fastener easily removable and replaceable without the use of special tools.

G. Realization by governmental agencies that fastener problems exist and the greater recognition



"Keep away from baling wire methods of assembly."

of fasteners that provide ease of replaceability in service and overhaul.

H. Freedom to design fasteners to replace existing ones that fail so that a permanent repair can be obtained.

Only when the foregoing have been accomplished can we expect:

- 1. Complete fastening safety.
- 2. More simple installation.
- 3. More simple replacement.
- Elimination of over-size and under-size fasteners for replacement.
- 5. Elimination of special machining tools.
- Elimination of special installation, removal and replacement tools.
- Elimination of fasteners with special threads and the tooling to install same.
- A great deal of government material could be salvaged by the use of special fastenings.

ELIMINATING EXPENSIVE FAILURES

It has often been said that the government buys a vehicle or a unit complete, and will accept it as long as it meets certain specifications. It is extremely important in today's space age vehicles that the government engineer and buyer be aware of the importance of the fastenings holding the assembly together and keep away from "baling wire" methods of fastening that may result in ex-

pensive failures. When the government uses this method of buying it is penalized when the unit requires overhaul and service. The extra cost in time and material can be attributed to two basic causes:

A. The manufacturer recommends his parts be the only ones used. The result is the government may continue to buy replacement parts which, in many cases, have failed and may fail again. The government does not avail itself of the possible usage of fastenings which might solve their fastening problem; improve the application; make it failure-proof.

B. It would also be of great value to the designer if the standard sheet had information regarding the servicing of a fastener in the field—such as the standard or special tools necessary for removal and replacement and whether oversized parts are necessary to service this fastening. Service departments of government agencies should be given the opportunity to solve fastening problems with better performing fasteners.

A PART OF TODAY'S TECHNOLOGY

Using a correct fastening for an application, whether it is in the original design or in overhaul or service, will result in tremendous savings and in a better vehicle or unit.

American industry can meet the challenge of "Keeping Fasteners in Pace with the Space Age." It is now up to the engineering and purchasing departments in both industry and government to recognize that fasteners are part of this space age technology.



"Traditional fastener designs were never intended to withstand the . . . stress . . . and . . . vibration demands of the space age."



RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY



Technical-ities

By John S. Davey

Selecting the right grade of nuts

"Workhorse" among nuts is the standard "FINISHED" series. It gives good seating area; sufficient height to sustain high thread tension; enough wall thickness to control elastic nut dilation under load.

"HEAVY" nuts are wider than "Finished" nuts in all sizes by only \(\frac{1}{2} \)" across flats. Thus, their value diminishes as size increases. Most effective in \(\frac{1}{2} \)" range, they satisfy applications involving excessive clearance holes, unusual loads, and certain boiler codes. MATERIALS? The regular

MATERIALS? The regular carbon nut steel (non heat treated). It makes nuts strong enough to pull bolts beyond yield point, lets threads distribute load to avoid stripping.

MUTS WITH "SPECIAL" FUNCTION

JAM NUTS are made for position locking. Use of two together forms a superior and
economical locking device.

When used to lock a regular
nut, jam nut should be adjacent to work surface. Otherwise, the jam nut takes the load

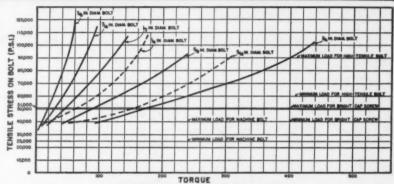
a job it wasn't designed for.



Use a 2H NUT where high temperatures call for stability. HIGH NUTS are used for

shackle, U and tractor pad bolts. They're furnished only in fine threads, therefore, and hardened. More to be recommended are coarse thread finished nuts.

Tightening up fasteners tightens down on costs



EAD SOLID LINES IN FOOT-POUNDS -BROKEN LINES IN INCH-POUNDS

These curves suggest torques for proper tightening of three grades of standard fasteners. Tightening to the upper limits delivers more of the holding power paid for, and assures stronger joints. Dropping below minimum values wastes fastener strength, invites loosening and failures. These curves are reproduced in RBaW Booklet DC-1.

It pays to go the limit in tightening bolts. Not only is it more economical, but safer too. For strength of a rigid connection depends on residual tension rather than on how strong the bolts are. Applying this fact can help avoid cost penalty.

EXAMPLE:

Blueprint specifies alloy bolts with strength of 145,000 psi. But assembly specification calls for tightening to what has been found an adequate pre-loading ... only 30,000 psi. This wastes the fastener's capacity. It provides no more joint-strength than supplied by a far more economical RB&W bright cap screw tightened to same pre-load. It would be better to switch to the lower grade, or reduce size of the premium grade fastener.

REDUCING SIZE ALSO SAVES

A fastener's holding power is the same as its pre-load, or residual tension. So long as it permits tightening to the required pre-loading, the bolt can be small as possible.

EXAMPLE:

Design requires fasteners with safe load capacity of 20,000 lbs. Bright cap screws of ¾" size will do it; but so will ¾" RB&W High Strength Bolts — at less cost. Actually, for the same holding power as in \$1.00 worth of high tensile fasteners, \$1.50 worth of bright cap screws are required.

PRODUCTION BENEFITS

Along with direct savings, smaller bolts mean smaller holes to drill or tap. Smaller holes often allow reduction in size of fastened members.

Talk to an RB&W fastener expert at the design stage of your product. He can help you cut costs without cutting joint strength.

Meanwhile, send for helpful booklet DC-1. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.



Plants at: Port Chester, N.Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. Additional sales offices at: Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco.



by **Lawrence A. Maher** Factory Manager Westfield Mfg. Co.

FROM BICYCLES TO FURNITURE

Westfield, Mass., firm uses blind
fasteners in school furniture to help satisfy
customer preference for unmarred frames

NE of the most important decisions that Westfield Manufacturing Company had to resolve when we inaugurated a new production line for school furniture was the selection of the fastening methods. What proved the deciding factors were finishes and customer preference.

The decision to enter such a competitive field was a major one, since our reputation was built on Columbia bicycles. But an analysis of plant equipment, production experience and marketing potential left no doubt as to the wisdom of the move. First, like other bicycle manufacturers, Westfield had severely felt the effect of imports. And although production rates on bicycles approximate 250,000 a year, management wanted a second line of products. Another significant aspect was that plant equipment and production cycles already established for bicycles could be altered easily to handle furniture.

The production sequence for a Columbia bicycle starts when steel strip is fed into a tube mill which automatically forms it into a tubular section, welds and cuts it to specified length. The 1-inch and %-inch diameter sections are then

Skirt of school desk is wrapped around a leg, and clamped in position, top; drilled and riveted, center. Rivets are then set in front surface where skirt bends around corner, bottom.

Holes in wooden back and seat are aligned with those in frame and the parts riveted together. Grommet is placed between sections to insure level surface.

formed into the geometrical shape needed for a bicycle frame on standard tube-bending equipment. After welding, brazing and finishing, the frame is hung on an overhead conveyor, and moved from one department to another, ultimately ending up as an assembled Columbia bike.

Tubular parts for chair and desk frames are made on the same forming equipment, and brazed together by the same methods. Several more operations are necessary, such as tapering the tubular sections. In general, these modifications are easily handled. Finishing, however, requires completely different procedures, and the method of fastening becomes an influencing factor.

Westfield makes two lines of furniture—the Standard line and the Flairline. Both styles can be obtained in a choice of finishes—enamel and chrome. It was not difficult to set up the procedure for fastening the enameled parts together. Frames were welded and brazed to metal bookboxes. The entire unit was dipped, baked and fitted with the necessary wooden panels. But with chrome this wasn't practical. The frame had to be plated and the book-box enameled separately. Then both had to be assembled together in a subsequent operation. At this point, assembly became a problem.

CONSIDERATION FOR USAGE BY CHILDREN

A fastener was needed which would not loosen under the rough use given the furniture by school children. And of great importance was the need for a blind fastener to satisfy customer's preferences. According to Westfield's furniture orders, the trend is toward chrome finishes and an unmarred frame. This trend may eventually eliminate the rivet or wood screw that pierces both walls of the tubular section, and require more blind fasteners.

At any rate, Westfield decided on Pop rivets for the furniture. Basically, this fastener consists of a thick wall cylinder and an internal mandrel. To set the rivet, tension is applied to one end of the mandrel. This pulls the head into the shank, upsets it, and sets the clinch against the work. The mandrel breaks off at a predetermined load, either at the head or in the shank, depending on the type of rivet used.

Integrating this fastener into our assembly operation has, on some furniture models, helped double production.

The skirt portion of one open-front table desk in the Standard model line is attached to each of four chromed legs with two 1/4-inch steel rivets. First the skirt is positioned, held in place with



Long-nosed hand pliers is used to set rivet which attaches rubber cushion stops to school desk. About ¼-in. space is left between the set rivet and top of the cushion.



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From Bicycles to Furniture, continued

a clamp and the hole drilled with a small hand tool. The rivets are inserted and set—from the outside of the front legs and from the inside of the back legs—using a power gun.

Marketed in 1958 for the first time, the new Flairline furniture has a number of riveted fastenings. Both the wooden seat and the back of one chair model rest on plastic grommets that insure a level surface and provide some cushioning. Seven steel rivets, of 0.200-inch diameter, attach the wooden piece and the grommet to the 0.0500-inch thick wall of the frame. The total thickness of the riveted section is 0.518 inches.

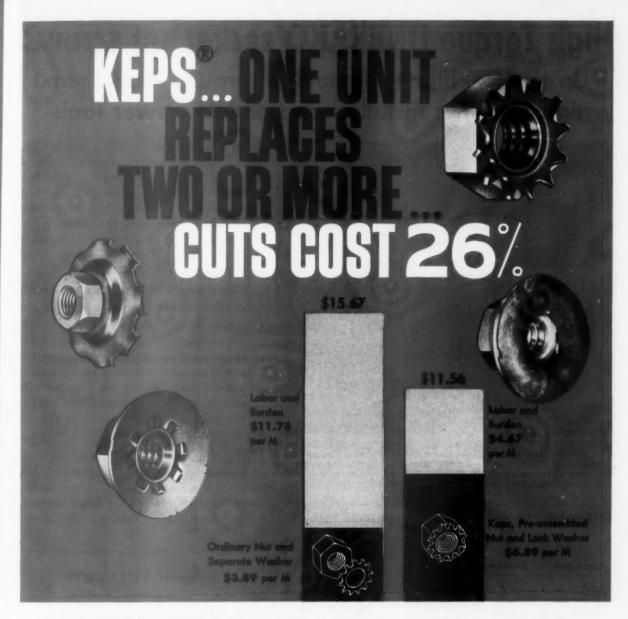
A desk and chair combination, another new item in the Flairline series, was designed to take advantage of latest advances in fastening techniques. Where access is easy, wood screws are used; where the joint is difficult to get at or is blind, Pop rivets are used. One such location is where the desk is attached to the frame. This is done by first marking the location for six holes on the frame and the desk with a template. A workman using a small pistol-type tool, drills the holes to specified sizes, aligns the box on the frame, and sets the rivets with a portable air-hydraulic gun.

Blind fasteners are growing in popularity at Westfield. In one application, rubber stops, formerly attached to the wood top with wood screws, have been relocated and riveted. Even the bicycle division has felt the effect. Bike lights now are attached to the front fender using two rivets and washers.

At Westfield, we do not rely on any one type fastener exclusively—rivets included. Fasteners are selected on the basis of availability, adaptability, and cost. Giving each its importance, we then make the selection. So far, results have proven this method.



Assembly and Fastener Engineering



Keps—mechanically pre-assembled Shakeproof® Lock Washers and nuts—eliminate handling two or more separate parts on the assembly line. Case studies in hundreds of applications prove that Keps save time and substantially reduce costs.

For example, the total cost of ordinary nuts and separate washers averages \$15.67 per thousand (chart above at left). Compare that with Keps (above right)—labor and burden are cut in half because Keps do not require hand assembly of nut and washer—total cost is down to \$11.56 per thousand. On the average, Keps save 26% of total

fastening cost! Your best opportunity for real savings is not in lower fastener prices but in labor saving fasteners like Keps. A complete discussion of this important concept is contained in the Shakeproof "Price-Per-Thousand" booklet. Be sure to write for your copy today.

Keps are available in a wide range of sizes in Standard Machine Screw and Finished Hexagon Series. Other types that offer even greater costsaving opportunities are Dished Washer Keps, Domed Washer Keps, Sealing Keps and special-dimension Keps. Try them now!



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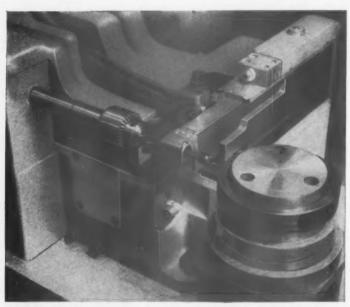
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Up to 40% higher tightening torques keep them tight whether installed by hand or power tools



NEW SPS SETOMATIC® automates socket set screw driving, will install set screws with any type point to full recommended tightening torque at rates as high as 2500 an hour. It can be set up for fully automatic operation, semiautomatic operation or manual operation. One manufacturer realized a 50% drop in installation costs, a 100% increase in production of finished assemblies.

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	Unbrako	Set Screw B		
#4	5	3.9	3.5	28
# 5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
# 10	33	26.5	25	25
3/4	87	62	60	40
5/14	165	122	125	32
3/8	290	198	225	29
2/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
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The High Torque UNBRAKO is made to withstand the highest tightening torques ever used to seat a set screw—up to 40% higher than that of an ordinary socket set screw. And whether you drive them by hand or with automatic power tools, you can apply the force required to seat them without damaging the screw and be assured of full high-torque performance in every case.

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High Torque UNBRAKO socket set screws are stocked by authorized SPS distributors. Ask the one nearest you for complete details. Or write Unbrako Socket Screw Division, STANDARD PRESSED STEEL Co., Jenkintown

HIGH RELIABILITY

SPS research is continually developing fasteners with higher standards of predictable performance. By installing SPS high-reliability fasteners in your assemblies, you increase overall product reliability.

For more information on the full meaning of reliability, write for a copy of the new SPS booklet "High Reliability."

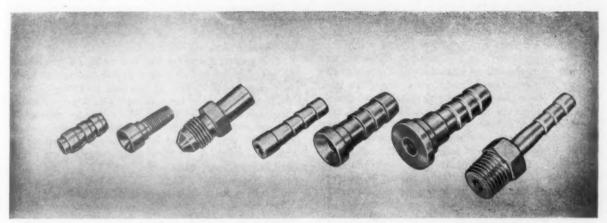
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These are all stainless hose connectors for beverage dispensers, except third from right which is for a jet fuel injector tube.



STAINLESS STEEL FASTENERS

Missiles and appliances, jet plane and camera equipment are typical of assembled products using special stainless steel fasteners



by W. E. McFee, Supervisor Product Information Service Armco Steel Corporation

During the past 10 years stainless steel has come a long way as a material for fasteners. Not only have most major fastener manufacturers worked this tough, durable metal into their standard line of products, but their designers continuously come up with special fasteners made from special grades of stainless to meet new and exacting requirements.

Unique demands are no longer the exception. Manufacturers of fasteners for jet aircraft, for example, have the problem of maintaining strength and corrosion resistance at high temperatures. Stainless steel has been one of their most practical solutions.

Production and handling of highly corrosive chemicals presents altogether different fastener problems. But again stainless steel has been a solution.

In still another field the non-magnetic qualities of some stainless steel grades have been a great help to makers of various kinds of electrical equipment. And not the least important, this attractive metal is used extensively where appearance of fasteners is a factor.

Stainless steel is a family of many different types of steel. For example, at Armco we melt more than 100 different compositions of stainless steel.

Although all these analyses have certain characteristics in common, each has a feature that distinguishes it from all others. This is why manufacturers can choose a stainless grade that is tailormade to solve their specific problems.

Although most stainless grades are stronger and

tougher than ordinary carbon steel, fastener manufacturers have developed fabricating techniques that are similar for both steels.

Most stainless grades are now being made into standard fastener lines by the conventional methods of cold-heading and hot-forging. Some unusual fasteners have to be machined, simply because of their size or shape. Threads are often machined in stainless fasteners, but roll threading is also common.

Fastener research is not limited to production techniques alone. Many manufacturers are working closely with basic steel producers to bring into their standard lines fasteners with special properties.

One of these is high strength at elevated temperatures. That's one reason why 17-14 Cu-Mo stainless was developed by the Armco Research Laboratories. It gives excellent long-time performance up to 1500 F. This temperature can be exceeded for short operating periods such as would be encountered in jet aircraft and other types of engines.

This special stainless also can be easily cold worked and develops ultimate strength by cold working plus heat treating. In other words, a bolt can be brought to top strength by cold heading and extruding the shank before heat treatment. Machining has a similar cold working effect. In either case, 17-14 Cu-Mo has proved an excellent material for high temperature fasteners.

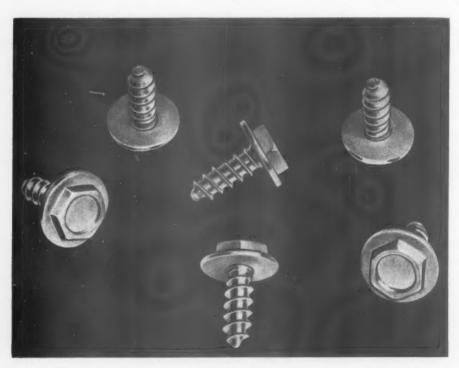
A stainless grade with long-time shear strength at temperatures up to 600 F is 17-4 PH. And its shear strength is adequate for many uses at temperatures up to 1200 F.

This precipitation hardening grade has been cold headed or machined in the as-shipped condition. Then ultimate shear properties are reached with a low heat treatment of only 875 F.

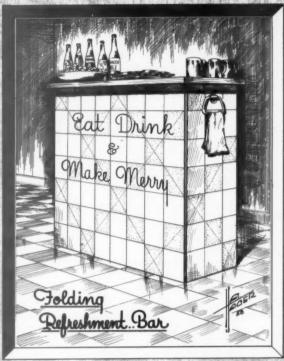
This means that 17-4 PH can be finish machined or cold headed and threaded before hardening with no danger of distortion in the heat treatment.

These are just a few examples of what stainless steel means to the engineer. They give an indication of how cooperative research between fastener manufacturers and basic steel producers is providing practical solutions to some of industry's most difficult fastener problems.

On the following pages are illustrations of many different types of fasteners made from stainless steel. They are used in a variety of products, including appliances, aircraft, marine electronic equipment, aluminum windows, relay switches, food vending equipment, etc.

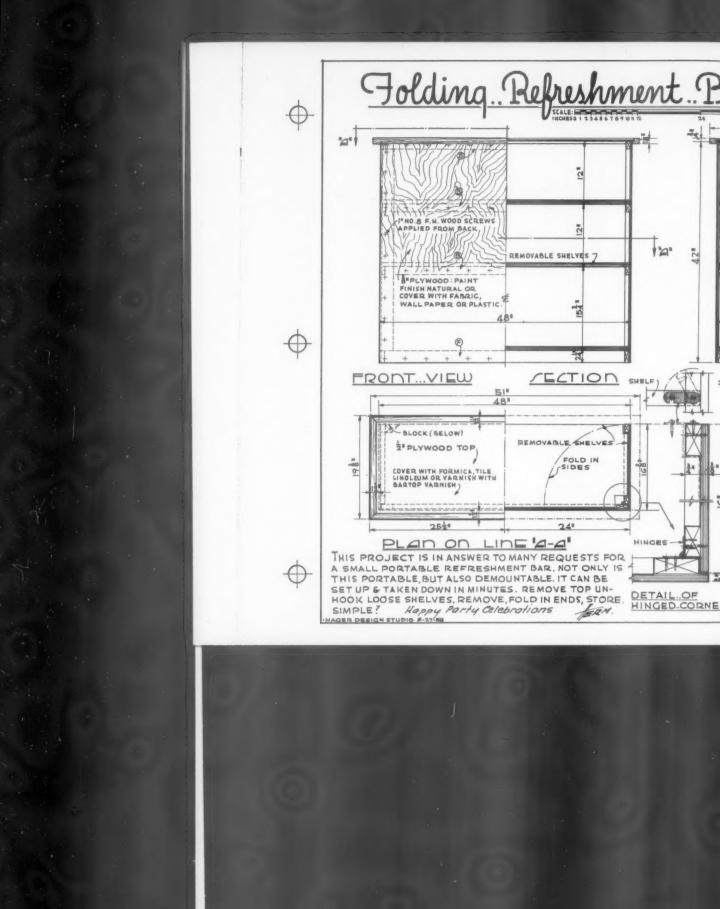


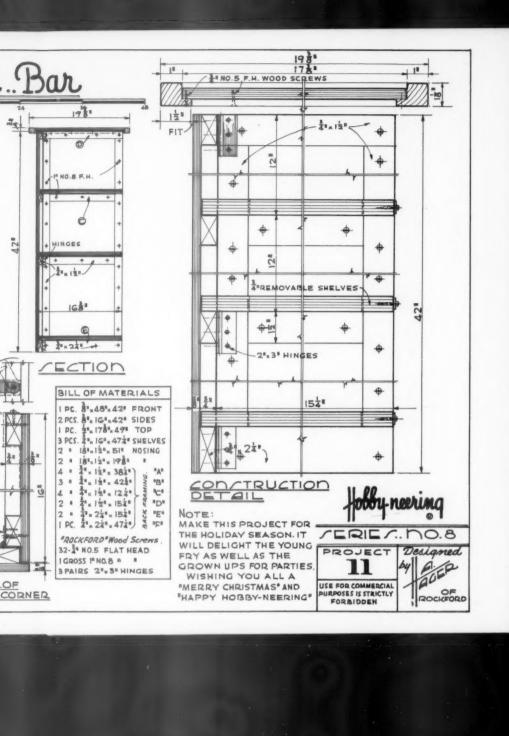
Most aluminum window and awning manufacturers recommend stainless steel fasteners for strength and corrosion resistance. They usually preferone of the magnetic chromium grades because the screws are inserted by magnetic drivers. Ample strength permits the screws to be driven without first punching a hole in the sheet. Those shown here are made of type 410 stainless.





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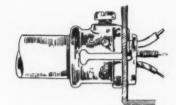
* HERE THERE AND EVERYWHERE with "ROCKFORD" Screws and Bolts *

"ROCKFORD" SCREWS USED IN THESE PARTS



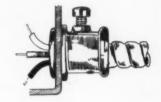
FOR CONDUIT

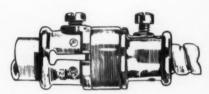






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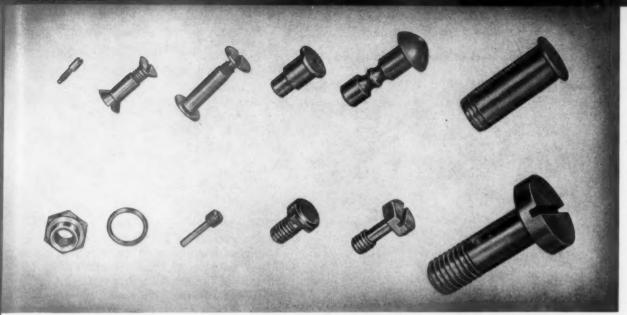
"ROCKFORD" NUTS AND SPECIAL STUDS ARE USED.





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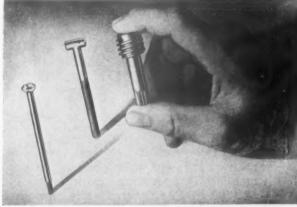
A Complete Line of Fasteners Fabricated in Our Three Modern Plants



Here is an excellent variety of applications and designs for fasteners. Each was designed to perform a specific job, and each required a particular grade of stainless to gain one or more of the inherent properties of the base metal. These included heat resistance, corrosion resistance, durability, strength, resistance to wear and abrasion, ease of cleaning, attractive appearance and low maintenance costs.

Left to right, top row: Adjusting screw for regulating gages and meters, type 302 stainless. A special mating unit to hold plastic assemblies, type 416. Male and female self-locking adjustment screws for dishwasher nozzles, type 304. Roller axle for shower doors, type 430. Lock pins for citrus tree spraying equipment, type 302. Clevis pin for landing gear of supersonic aircraft, type 431.

Bottom row: A locating lock nut for radar equipment, type 316 stainless steel. Precision ring for a floating gyro-mechanism, type 302. Combination adjusting screw and pivot pin for photographic equipment, type 302. Clamp mounting screw for automatic gyros, type 302. Captive screw for marine electronic equipment, type 302. Link pin for cracking plant equipment in oil industry, type 302.



These two long fasteners and valve stem illustrate the versatility of hot and cold forming techniques being developed by the fastener industry. The close tolerance body screw at left is made from type 302 stainless steel. Center is T-head bolt made from type 431. At right is valve stem made from type 410.

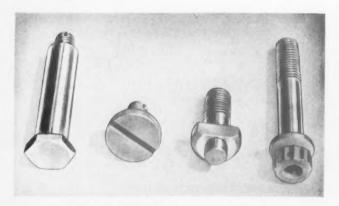


Special stainless fasteners, produced to the user's specifications, are becoming more and more popular. Special threads, undercutting, and drilling are no longer rare as the result of improved production techniques as illustrated in these fasteners.

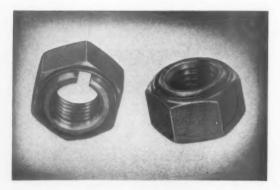
The Role of Stainless Steel in Fasteners, continued



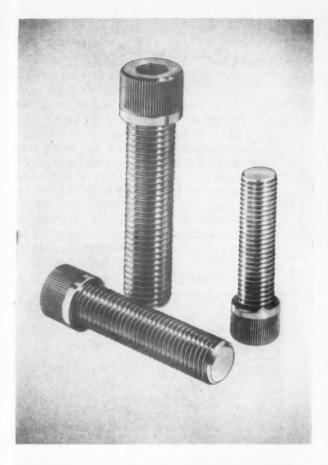
The fasteners shown here represent a variety of applications from household appliances to aircraft. Their unusual shapes are an indication of the versatility of the stainless steels. Top row, left to right: Refrigerator decorative trim screw; electrical control part for household appliance; aircraft fastener. Middle: outside fastener for automobile accessory; c o o k in g utensil fastener; laundry appliance fastener. Bottom: component of electric relay switch; food vending unit fastener.

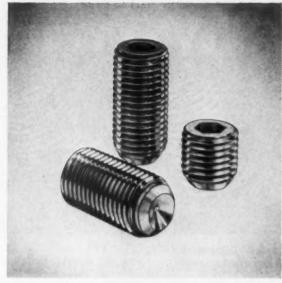


These fasteners, made of 12-2W stainless steel, are being used in various parts of jet engines. This grade of stainless is especially useful in any applications where high temperatures are an important factor.

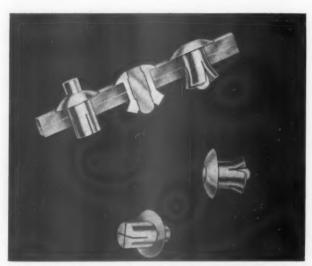


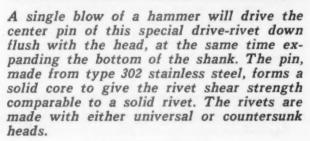
This two-piece self-locking nut has many uses, but is especially recommended for operating temperatures up to 1600 F. The tapered split, threaded core is made of type 347 stainless steel, which is especially resistant to scaling and so resists seizure to bolt threads. In tightening, the shell stops at the assembly surface and squeezes the tapered core against the bolt threads in a collet-type fashion. Releasing the tension permits the core to slip back into its original position for easy removal with no damage to threads. The shell is made from 17-14 Cu-Mo stainless steel.

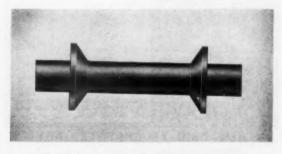




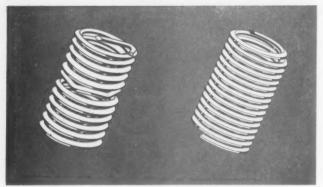
Tiny fasteners can be precision made from type 302 stainless steel. Some of those shown are as small as 1/16 of an inch long. In this size there are 80 threads to the inch. The strength of stainless permits torques up to 45 percent higher than for ordinary fasteners. This high strength means that smaller or fewer fasteners can be used.





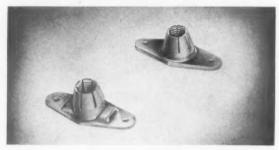


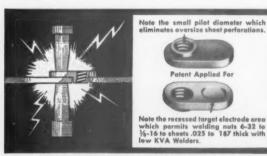
Both collars of this stainless steel spacer are produced simultaneously in a double-heading machine. Fasteners such as this can be cold-headed to close tolerances with considerable savings over machining.



The precision-formed coils of stainless screw thread insert (right) are corrosion- and stripproof. They are so strong that even in soft metals excessive torque will shear off the bolt before the female threads will strip. Of simple, onepiece design, the stainless screwlock insert (left) has a re-usable locking feature which puts the locking effect inside the tapped hole.

Here are two designs of a high temperature two-lug anchor lock nut. The manufacturer says it is as much as 45 percent lighter than their previous designs of similar nuts. Recommended for temperatures up to 1200 F, the body is of type 347 and the lugs of type 321 stainless steel. As a result the body retains its elastic deflection characteristics and resists scaling at high temperatures. This makes the nut reusable. The titanium-stabilized stainless lugs have excellent welding qualities.





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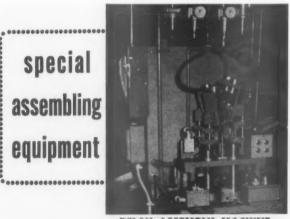
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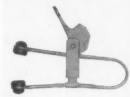
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21/4". The spring is completely enclosed for protection to the operator as well as to the clamp itself. The EDGELOCK is set and released with clamp-setting pliers. A Product of



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Made in all popular sizes of standard nuts, as well as "Huglock" and "Marsden" locknuts.

Even though your requirements may be in the multimillion bracket . . . because of our tremendous producing facilities, we can supply most any reasonable demand of delivery from stock in the popular sizes... And we have a comparable ability to produce special items on sudden demand . . . Our application engineers, are also at your disposal, without any obligation—a service that has meant much to industry in the solution of fastening problems . . . We have a one hundred and forty-two page catalog that should be in the file of every design and purchasing department of large users of this product . . . we suggest that you request it on your letterhead.

*12 Pointer Standards, sizes: 14" to 14"—brochure on request

MACHINE

NATIONAL Manufacturer of Standard and Special *12 Pointer and Hexagon Muls ... "Huglock" and "Marsden" lockwels.

44225 Utica Rd., UTICA, Michigan



YOU GET PRECISION FASTENING AT MASS PRODUCTION COSTS...

. . . when Thomson becomes your fastening partner.

In the Thomson line of more than 8,000 rivet designs, you'll find the semi-tubular, deep-drilled, bifurcated (split), shouldered or compression rivet that will give you the best strength-cost ratio in the fastening field. Produced to the industry's highest quality standards at production rates exceeding 20,000,000 rivets a day, these low-cost fasteners merit serious consideration in your product-improvement and cost-reduction programs.

Our leadership in solving fastening problems with quality rivets and precision rivet-setting machines since 1885 is at your service. What is your problem?



WHAT'S NEW IN EQUIPMENT

For information on any equipment listed here, use the postpaid card opposite page 64. Just circle the number on the card matching the number following the description. We'll do the rest.

FLUX ELIMINATES CHARRING DURING TORCH SOLDERING

There is no oxidizing or charring when this fluxing paste is used for torch soldering. An increased percentage of chemical fluxing ingredient is given the credit.

Farsol paste also eliminates any suspense between the melting point of the solder and its flowing in a smooth, clean tinning. The paste is dehydrated in manufacture which does away with supper or boiling in application.

Farrelloy Co., 1231 N. 26th St., Philadelphia 21, Pa.

Uso postpaid card. Circle No. 101

RATCHET HANDLE AND SET SOCKET WITH 1/2" DRIVE

One-half inch square drive ratchet handle and socket sets, featuring a 10point socket style, have been added to a line of wrenches.

The interchangeable sockets are available in conventional 12-point sizes as well as combination or 10-point sizes. Ratchet action is reversed by flicking the reversing level. Handy for use where working arc is limited.

Lowell Wrench Co., 54 Commercial St., Worcester 8, Mass.

Use postpaid eard. Circle No. 102

NUTSETTER HAS TORQUE RANGE OF 30-100 FT. LBS.

A completely-hydraulic control system, designed for multiple nutsetting, delivers uniform torque to one foot pound simultaneously up to 20 threaded fasteners of various sizes and bolt patterns.

In a production line test at a leading automobile plant, the Thor-Draulic, driving two spindles, tightened 6000 nuts a day for four months without failure

A single valve control permits variation of pressure and resultant torque range of 30 to 100 foot pounds. The machine has a rundown speed of 300 rpm can be balancer-, torque arm-, bench- or machine-mounted, and can be adapted to control the driving of multiple power tools other than nutsetters.

Thor Power Tool Co., 175 N. State St., Aurora, Ill.

Use postpaid eard. Circle No. 103

HIGH TENSION SPRING CLAMP WITH 65 LB. GRIP

A spring clamp for holding edges of two or more thicknesses of wood, metal, plastic, fiberglass and other workable materials is now in production.

The Edgelock clamp has a grip capacity of 65 lbs. Jaw openings 1", weight is approximately 1 oz., over-all length is 2\(\frac{1}{4}\)". The spring is completely enclosed for protection to the operator as well as to the clamp itself. The clamp is set and released with clamp-setting steel pliers.

Wedgelock Corp., 5446 Satsuma St., North Hollywood, Calif.

Use postpaid card. Circle No. 104

QUICK-ADJUSTING WRENCH

Forged steel wrenches, whose jaws close automatically on whatever size nut being tightened with a flick of the wrist, come in three sizes. Each size handles square or hex nuts. Sizes: No. 1—3/16" to 5%"; No. 2—3%" to 1%"; No. 3—9/16" to 1-9/16".

Custanite Corp., 1228 Utica Ave., Brooklyn, N.Y.

Use postpaid card. Circle No. 105

ADJUSTABLE STUD DRIVER HAS SMALL DIAMETER

A stud driver designed for builders of aircraft engine and component parts drives studs where limited space demands a driver of small diameter. The driver can be adjusted for various lengths of grip on the stud without use of wrenches or tools. Where a spacer is used, projection heights are a matter of .002 or .003 variation.

Mustang stud drivers are made in two sizes for hand or power use: No.



(See 101)



(See 104)



(See 105)



(See 103)

1 (Max. Cap %") and No. 2 (Max. Cap. 9/16").

Titan Tool Co., Fairview (Erie County), Pa.

Use postpaid card. Circle No. 106

HIGH-TORQUE SCREWDRIVER AND %" DRILL UNIT



The Driver-Drill combines the features of a high-torque positive drive screwdriver and a ¾" drill in the same unit. The portable power tool spans the complete range of driving jobs and can drill holes in wood or steel by attaching a special geared key drill chuck with ¼" hex shank.

The tool capacities: screwdriver—wood screws, No. 14-3", machine screws, ¼"; drill—in steel, ¾".

It is available in pistol grip or saw grip models.

Millers Falls Co., Greenfield, Mass.
Use postpaid card. Circle No. 107

OPTICAL MAGNIFIER CHECKS THREADS WITH PATTERN



A magnifying comparator checks radii, angles, chamfers, threads, small holes, lineal, radial and tangent dimensions and odd shapes, among other uses. Needing no additional light source, the magnifier compares small parts and objects with a transparent, dimensional-scale pattern, instantly revealing accurate plus or minus measurement.

The instrument, supplied in either desk or pocket models, is equipped with four pairs of easy-to-read reticles that measure ½" by .005" in decimal divisions, ½" by 64ths, 15 mm. by 0.1 mm.

divisions, full circle protractor by 1° divisions. The reticles are supplied in pairs of the same pattern with one having black lines, one white lines to insure contrast with the work being measured.

Finescale Co., 218 So. Western Ave., Los Angeles 4, Calif.

Use postpaid card. Circle No. 108

NO DIPPING IN FLUX CAN WITH COATED WELDING ROD

A flux-coated welding and brazing rod has been designed for bronze and fusion welding and for surface build-up. The oxyacetylene welding rod is made of degasified, deoxidized, low fuming bronze to which a special coating has been applied which eliminates the need to dip rod in flux can.

Aufhauser Brothers, Albertson, L.I.,

Use postpaid card. Circle No. 109

OVERLOAD CLUTCHES RATED 0-84 AND 48-120 INCH LBS.



Mechanical overload clutches protect against damage and permit maximum usage of rated machine capacity. Standard ratings for Safe-Torque are 0 to 84 inch pounds and 48 to 120 inch pounds, available in one-shot or overriding types.

The clutches have been tested successfully on drive shafts powered by air, electric motors and hand power. They provide precise, instant release whenever preset torque is exceeded. When torque is exceeded, rollers, wedged between the inner cam drive and outer shell, override the high points on the drive and roll into a free position. The driven member becomes freewheeling.

Scully-Jones & Co., 1901 S. Rockwell St., Chicago 8, Ill.

Use postpaid card. Circle No. 110

LESS AFTERCLEANING WITH TORCH BRAZING FLUX

Supercleanness of the work after brazing is claimed for a liquid flux for torch brazing where automatic fluxing systems are used. The flux also eliminates virtually all aftercleaning.

The flux is designed for dispensing from the firm's single-valve container through which the liquid is metered into the acetylene or propane gas line leading to the brazing torch. It is usable, however, with any automatic fluxing system.

All-State Welding Alloys Co., 249-55 Ferris Ave., White Plains, N.Y.

Use postpaid card. Circle No. 111

DEVICE GAGES TENSILE STRENGTH OF FASTENERS



Quick, accurate checks of fastener tensile strength are possible with a hydraulic device which measures bolt tension by pressure created when the bolt or nut is tightened. Tension is read directly in pounds on a specially calibrated pressure gage.

Assembly departments find the tester useful for calibrating power wrenches and for training assembly personnel to develop an accurate "feel" for proper torque.

Skidmore-Wilhelm Mfg. Co., 442 Green Rd., Cleveland 21, Ohio.

Use postpaid eard. Circle No. 112

SETTER FEEDS AND STAKES 100 TERMINALS A MINUTE



Designed to feed and set up to 100 standard turret or seamed terminals per minute is the all-electric, automatic terminal setter, Model FST. The Automatic Electroset claims speeded-up assembly through automatic feeding and fast staking, both rate of terminal feed and staking blow under control of an operator.

Terminals are oriented and fed to a staking nest from a vibratory feeder. Operator places board over terminal



COLD HEADING MACHINERY

Cold Headers • Parts Formers •
Nut Formers • Slotters • Threaders •
Pointers • Trimmers and other Cold and
Hot Forming Equipment



ROLLING MILL MACHINERY

Two-High and
Four-High Mills
Special Mills
Sendzimir Mills
Rod Mills • Slitters
Coilers • Winders
Straighteners
Payoffs • Edgers
Coil Boxes •
And Other Mill
Equipment



WIRE MILL EQUIPMENT

And Upright Cone
Wire Drawing
Machines • Bull
Blocks • Wire
Flattening Mills •



Swagers • Roll Pointing Machines • Spoolers • And Other Wire Equipment

0

POWER PRESSES

Cam and Crank Eyelet Machines • Horizontal Redraw Presses • Multiple Plunger Pillar Presses • High Speed Blanking Presses • Collapsible Tube Equipment • Ammunition Machinery, etc.

THE WATERBURY FARREL FOUNDRY & MACHINE CO. DIVISION OF TEXTRON INC.

Waterbury Connecticut . ILS A

Sales Offices: Chicago . Cleveland . Los Angeles . Millburn, N.

and actuates machine with a foot switch staking terminal in board. Powerdriven feed advances each terminal to the nest.

To aid proper board placing, a light source under the punch head indicates the exact location of the next terminal when hidden by the board. The machine is adaptable for feeding and setting contacts, pins, shoulder studs and plug nuts.

Black & Webster Inc., 445 Watertown St., Newton, Mass.

Use postpaid card. Circle No. 113

ONE-SIDE SPOT WELDING FOR CABINET HOUSING



Spot welding from one side of the work without distortion or backup is said to open up new possibilities in manufacturing cabinet housing for electronic equipment and appliances. It is a solution where welding is desirable

but difficult or impossible from two sides.

Heart of the welder is a special powered-iron-coated welding rod with starting tip, which arcs immediately on contact with the work. Rods are available in 1/16" and 5/64 diameters. The panel welder is designed for use with any welding machine (AC or DC) of 125 amps or more.

Buckling of panels is reportedly almost entirely eliminated because the welder uses low heat in an unusually small area.

Schott Metal Products Co., 2225 Lee Rd., Akron 6, Ohio.

Use postuaid card. Circle No. 114

TORQUE WRENCH SLIDE RULE



A torque wrench scale slide rule comes in handy pocket-sized form with complete instructions for interpreting. Designed for use with adapters and capable of being read in foot-lbs., inch-lbs., inch-ounces or inch-grams, depending on scale reading.

P. A. Sturtevant Co., Addison, Ill.

ROTARY PARTS-FEEDER



A rotary type parts-feeder with live rollers makes it almost impossible for parts to jam in the discharge track.

The Hoppermatic Model-R combines the cast drum of the standard model having built-in universal pick-up pockets with the drum rollers, for greater versatility and higher feed rates for screws, rivets, set screws and other parts. Sticking or jamming of sharp point items is eliminated by the constantly moving rollers which are self-freeing.

Change-over from one size or shape to another can be made in five minutes time with no change-over parts required. The machine can be provided

NEW NYLON PARTS from GRC

Economically mass produced on fully automatic patented machines, GRC nylon parts are available from stock in many sizes and types. GRC uses single cavity, techniques, malds in one automatic cycle, gets accurate, uniform parts, ready for immediate use.

These advantages, these economies, apply too, to tiny made-to-order parts to your specifications... in quantities of 25,000 to many millions. Write for bulletin describing GRC's unique method for injection molding small plastic parts or send prints for quotation. Ask about our zinc alloy die castings, too!

NO SIZE TOO SMALL Maximum size: 11/4" long, __0302



NYLON SCREWS FOR LESS THAN YOU THINK!

That's right! GRC's unique automatic single cavity molding techniques not only give you exceptional uniformity and accuracy but also unbelievable economy. For example:

No. 8-32 x ½" MACHINE SCREWS \$1080 M

(100,000 lots)

Take advantage of nylon's outstanding prop-

erties . . . and take advantage of the outstanding savings possible with GRC molded nylon fasteners—set screws, screw insulators, washers, etc.—available from stock in a wide range of types,

sizes and lengths.
Write, wire, phone
NOW for GRC's
new catalog of Die
Cast and Molded
Fasteners.

GRIFS

GRIES REPRODUCER CORP. World's Foremost Producer of Small Die Castings 15 Second Street. New Rochelle, N. Y. New Ro

15 Second Street, New Rochelle, N. Y. • New Rochelle, 3-8600
Use postpoid card. Circle No. 238



Use postpaid card. Circle No. 239

Assembly and Fastener Engineering

with a mechanical release finger for counting purposes.

U.S. Engineering Co., 40-24 22nd St., Long Island City 1, N.Y.

Use nostnaid card, Circle No. 116

IMPACT WRENCHES RATED AT 34" NUT-SETTING

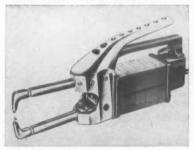


Two models of lightweight, small dimensioned impact wrenches are available, each rated at ¾" nut-setting capacity. Model 18B-7 is equipped with ¾" square drive and Model 18B-7S has ¾" built-in hexagon slip chuck.

Accessories for the wrench include stud drivers, socket adapters, hexagon shank, socket holders and universal joint socket adapters. Analysis of speed films resulted in the designing of a new impacting mechanism and the new wrench.

Gardner-Denver Co., Quincy, Ill.
Use postpaid card. Circle No. 117

PORTABLE SPOT WELDER HAS FIXED TOP TONG



The fixed top tong feature of the Rex spotwelder lets the operator rest the weight of the machine on the exact welding spot for added contact pressure. The clear throat of the new unit, unobstructed by flexible lead cable, eliminates the possibility of shorting the welding circuit through contact of work piece with the cable.

The Rex Junior weighs just 24 pounds. It was developed particularly for use in sheet metal shops and for general maintenance work and is not intended for high production welding.

Timing is manual allowing just the right heat for the weld. However, when automatic weld timing is desired, an automatic timer is available. Also available is a spring-loaded coil suspension support for the welder, exactly counteracting the weight at all heights. A two-color catalog and specification sheet with prices is available.

Peer, Inc., Benton Harbor, Mich.
Use postpaid card. Circle No. 118

yardstick

FOR EVALUATING

OOPER

BRAND

RECISION FASTENERS

(compared to bolts you are now using)

PE OF FASTENER AN, NAS, and MS standard fasteners and special fasteners for aircraft, en-

P

EXPERIENC

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PEOPL

SER

gine, missile, electronic and precision industrial use.

All finishes in alloys and super-alloys

All finishes in alloys and super-alloys non-ferrous and hi-temperature metals—in lengths no one else wants to make.

Cooper combined with SPS—an unsurpassed combination. The name Cooper has been closely associated with precision bolt improvement for more than 25 years.

Expanded new plant with the finest quality control equipment—dimensional, mechanical, metallurgical.

Completely integrated.

Screw thread metrology laboratory for solution of any thread problem.

Skilled craftsmen who work to one standard of quality—the finest.

Close organizational teamwork and varied company activities.

Largest inventories of finished and semi-finished fasteners—up to 30,000,000 units.

National stocking distributor organization staffed by fastener specialists who provide personal attention, immediate service.

Brochure on request

SPS WESTERN

2701 SOUTH HARBOR BOULEVARD, SANTA ANA, CALIFORNIA . Kimberly 5-9311

Division of Standard Pressed Steel Co., Jenkintown, Pa.

Use postpaid card. Circle No. 240

FASTENERS LARGE OF SMALL Contact

SCOVILL

We manufacture a wide range of unusual as well as standard cold headed fasteners.

Complete modern facilities available for heading, slotting, turning, slabbing, threading, drilling, secondary press work, plating and heat treating.

A SCOVILL Sales Engineer is in your area and at your call.

Send for your copy of "A Guide to the Profitable Use of Cold Heading."

Special Cold Headed Parts
Phillips Recessed Head Screws
Clutch Recessed Head Screws
Washer Screw Assemblies
(Sems)
Tapping Screws
Standard Machine Screws

Cold Headed Studs

SCOVILL

INDUSTRIAL FASTENER SALES

Waterville Division

Waterville 14, Connecticut

Use postpaid card. Circle No. 241

WHAT'S NEW IN FASTENERS

For further information on any of the fasteners listed here, use the handy postpaid card opposite page 64.

ONE-PIECE WASHER NUT USED FOR SHOCK MOUNTINGS One-piece hexagon washer nuts are

One-piece hexagon washer nuts are recommended for shock mountings, for retaining spring coils or for other applications where an object must be held in a fixed position under tension.

Lokuts are easy starting and lock any place on a screw or bolt, eliminating the need for a separate flat washer. Available sizes are No. 10 through ½". Samples available.

Shakeproof, Div. of Illinois Tool Works, St. Charles Rd., Elgin, Ill.

Use postpaid eard. Circle No. 119



Miniature brass nuts, now available in production quantities, are tapped square with faces to Class 2 tolerances, countersunk on both sides, burrless, degreased and can be supplied in single or double chamfered styles.

For application in miniaturized electrical and electronic equipment, these machine-turned nuts feature the same uniform accuracy as conventional sizes. Made in hexagon, cap (open or closed end) and knurled thumb types.

Fischer Special Mfg. Co., 496 Morgan Ave., Cincinnati 6, Ohio.

Use postpaid eard. Circle No. 120

COLOR CODING AIDS CLAMP HOLE SIZE SELECTION

Permanent color coding for quick accurate hole size selection has been added to a line of clamps—temporary holding devices for airframes, missiles and electronics.

Fine serrations, cut lengthwise on the fastener body, prevent color coding from being worn off as well as eliminate tendency to slip out of user's hand. Colors indicate Kleko sheet holder hold sizes: 3/32"—cadmium (silver); 1/4"-copper; 5/32"-black; 3/16"-brass.

Color coding is introduced in a new S-T-L (standard triple lock) Kleko clamp. S-T-L has fully enclosed spring and plunger with newly developed raised safety lip to insure clamp from slipping off or out of inserting plier during application or removal. Material thickness capacity of S-T-L is extended to a full quarter inch with 0" to ¼" grip range with 1/16" more holding capacity. S-T-L also features a heavy duty, pre-loaded spring with high tensile, positive grip needles and spreader.

Monogram Mfg., Kleko Div., 8557 Higuera St., Culver City, Calif.

Use postpaid eard, Circle No. 121

PEGBOARD PARTS TRAY

Hooked on pegboard above any working area, the Handee tray can hold small parts and tools in its adjustable divided compartments. Spaced hooks on the back of the steel tray make for easy placement. It is 18" long, 3" wide and 2" deep.

Industrial Marketing Svc., Box 2214, Ft. Dearborn Station, Dearborn, Mich.

Use postpoid card, Circle No. 122

ADHESIVES' SHEAR STRENGTH 495 PSI AT 600° F

Three synthetic-rubber, phenolic-resin-base adhesives possess a shear strength of 495 psi at 600° F.

strength of 495 psi at 600° F.
Ray-Bond R-81001, 81002 and 8114
are designed for rubber-to-metal,
plastics-to-metal, metal-to-metal and
friction materials bonding. All three
adhesives are thermosetting and differ
from each other only in viscosity. They
resist oils, brake fluids, solvents and
water, are resilient and withstand
shock.

The relative high viscosity of R-81002 permits assemblies which ordinarily would have poor contact between mating surfaces. Films up to .020" are built up.

Raybestos-Manhattan, Inc., Bridgeport 2, Conn.

" Use postpaid card, Circle No. 123

PACKAGED HEX HEAD BOLTS

A complete line of hex head bolts, furnished with or without hex nuts, are now available in standard packages or in bulk.

Clark Bros. Bolt Co., Milldale, Conn. Use postpaid eard. Circle No. 124



(See 122)



(See 119)

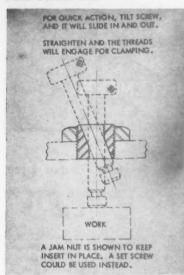


(See 121)



(See 120)

QUICK ACTING INSERT FOR CLAMPING



A quick acting insert for clamping can be easily installed on new and old fixtures by drilling and tapping a hole at the desired location. A jam nut or a set screw can be used to lock the insert in position. The inserts are hardened for long life and black penetrated to prevent rusting.

The inserts are available for 1/4-20, 5/16-18, 3/8-16, 1/2-13 or 5/8-11 screws.

Northwestern Tools, Inc., 117 Hollier Ave., Dayton 3, Ohio.

Use postpaid card. Circle No. 125

LOCKBOLT FASTENER FOR WIDE MATERIAL THICKNESS



A new utility design of the Huckbolt fastener features a wider material thickness range. Designated the C6L, the new design is recommended for joining metal, wood, rubber, plastic, honeycomb, and other materials which are difficult to fasten together.

A new lockbolt design extends the range of material thicknesses that can be joined with a given fastener size.

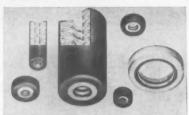
The utility fastener can be used with a new collar design that provides greater bearing area and permits broader dimensional tolerance in hole preparation. The new fastener is installed with standard Huck air-driven or hydraulically driven power tools, or with hand tools where applicable.

The C6L fastener is available in 3/16", 1/4", 5/16", 3/8", and 1/2" nominal pin diameters and in all head styles for metal-to-metal application (brazier, round or countersunk head).

Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

Use postpaid card. Circle No. 126

ELASTIC COVERING HOLDS SPRING WASHERS



A cartridge has been developed for applications where pins or rivets can-not be used to hold the washers together because the washer walls are too narrow, or where retaining rings or cores cannot be used because there is not sufficient vertical or radial clear-

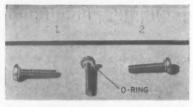
The Flexi-Pak Energy Cartridge features pre-assembled stacks of belleville spring washers held together by a flexible elastic covering. Being offered are a molded covering and a dipped or sprayed coating.

The cartridge is a compact spring unit which can be incorporated as a one-piece component. It insures that washers will always be installed in the correct sequence—an important consideration if the stack is ever removed in the field and re-installed. This is significant when the washers are stacked in a special sequence-some in series and some in parallel.

Divisions of Associated Spring Corp., Bristol, Conn.

Use postpaid card. Circle No. 127

MINIATURE SCREW RESISTS VIBRATION, FLUIDS



A subminiature screw intended for use in fine mechanisms, has been designed with a groove underneath the head to accommodate a silicone rubber O-ring. The new fastener has a 2-56 NC thread and a slotted head (APM Type "S").

Seelskrew's O-ring is compressed when installed to form a vibrationresistant seal. It is unaffected by fluids and is reusable.

Automatic & Precision Mfg. Co., 252 Hawthoren Ave., Yonkers, N.Y.
Use postpaid eard. Circle No. 128

KIT CONTAINS 25 O-RING SIZES, GAGING DEVICES



Maintenance men can choose from 180 O-rings in sizes from 1 to 25 in the Universal Select-O-Ring Kit No. 2 which is claimed to contain sizes used on 70% of industrial equipment sealed with O-rings.

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The shock-resistant, plastic case doubles as a gaging tool with all Orings packed on exact shaft-sized pegs. Cross section measurement comes from a small gage molded into the kit's side. Interchange information of all leading producers is supplied. Manufacturers' numbers are converted to the O-rings in the kit.

Bearings, Inc., 3634 Euclid Ave., Cleveland 15, Ohio.

Use postpaid eard. Circle No. 129

COMPRESSION FASTENER SEALS FROM AIR, LIGHT

A compression-type fastener is designed for air-tight, lightproof,

vibration-resistant application. The No. 25 fastener is cadmium plated and consists of a sliding, pivoted latch which is tightened down



under the action of a thumb screw. It has been primarily used where doors must be sealed against a gasket.

Free sample available.

Torit Mfg. Co., Walnut St. & Exchange St., St. Paul, Minn. Use postpaid card. Circle No. 130

NUT AND BOLT GAGE



For all who have occasion to "size" nuts and bolts, this 71/4"x2" red gage with white lettering is made to total tolerance of .005" in the critical dimensions. It is made of polystyrene, a plastic.

Sorrell Mfg. Co., 364 Elmwood Rd., Rock River 16, Ohio.

SELF-TAPPING INSERT AVOIDS THREAD STRIPPING



Four extra sharp cutting edges enable the Speed-Sert to cut its own thread as it is rotated into a cored or drilled hole, using a simple installation tool which fits into a standard tapping head. The insert protects against stripped threads.

The inserts are available in cadmiumplated carbon steel or stainless steel, as well as in brass.

Newton Insert Co., 6500 Avalon Blvd., Los Angeles 3, Calif.

Use postpaid card. Circle No. 132

VARIED LOCK WASHER LINE

The Tangle-proof lock washer line is available in high carbon steel, stain-

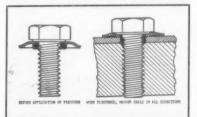
less steels, silicon and phosphor bronze. Plating to order allows these small units to assume the surface characteristics of special metals and alloys. Hoblock



Hammer-Lock and Loxit Extended Prong cotter pins are also available. Hobbs Mfg. Co., Worchester, Mass.

Use postpaid card. Circle No. 133

SEALING WASHER IMPROVES METAL ROOFING FASTENING



Three-directional sealing can be accomplished by applying pressure to a partially dome-shaped washer with a measured amount of sealing compound adhered to the underside.

The sealing action of these washersdownward, outward, upward-makes it possible to fasten metal roofing in the valleys for structural rigidity, permits use of shorter fasteners, provides neat appearance and weather protection.

The non-aging polyvinyl chloride base compound is stable and will not MACLEAN-Fogg

gives you product superiority and fast, low-cost assembly with the M·F line of lock nuts and standard nuts in all sizes "off the shelf"

M.F TWO-WAY



LOCK NUT for faster application with consistent torque

This all-metal, double chamfered, re-usable lock nut can be applied to bolt threads from either end. The center locking principle permits bolt end to be flush with top of nut.



M.F. UNI-TORQUE LOCK NUT for high torque consistency in full and jam thickness

This consistent-torque lock nut will withstand terrific vibration and shock loading; retains its locking ability for as many as 10 RE-applications.





Solve production delays, cut manufacturing costs fuse nut to the product in exact location. Engineered for assembly simplification. The welding of nuts to sub-assemblies permits the use of screws or bolts in the main assembly without the need for holding nuts from turning, cutting time and labor.

Both types available with the patented M • F Two-Way locking feature. Each type has three welding projections, eliminating rock and guaranteeing a uniform weld.

LOCK NUT



the nut with the built-in lockwasher

This free-spinning one-piece lock nut eliminates the need for supplemental locking devices such as lockwashers. Cuts purchasing and inventory costs.

for you for the asking



The M · F Products Catalog — valuable data on torque, bolt tension and dimensions as well as on other available products.

MAC LEAN-FOGG Lock Nut Company

5535 N. WOLCOTT STREET • CHICAGO 40, ILLINOIS

split or ozone-check under pressure. It withstands temperature extremes from minus 100° F. to plus 250°

L. J. Barwood Mfg. Co., 28 Williams St., Everett 49, Mass.

Use postpaid eard. Circle No. 134

BRACKET-BANDS USE BOLTS TO MOUNT SIGNS EASILY



Band-it Brack-it provide a permanent base to which signs or other attachments may be fastened with 5/16" stainless steel bolts. Forming and tapping eliminates the use of nuts.

The clamp is reinforced by placement of ribs. A large number of threads give the hexagon-head bolt solid anchorage and fibre and stainless steel washers prevent bolt from marring object when being installed.

Band-It Co., 4777 Dahlia St., Denver 16, Colo.

Use postpaid card. Circle No. 135

HIGH STRENGTH INSERT FOR SHORT THREAD BOLTS



A series of high strength ring locked inserts of use with all bolts featuring the curtailed thread length as exemplified by NAS 1100 Series has been designed. Fuel strength of 1,600,000 psi bolts may be developed by the new insert.

Additionally, thread locking to specification MIL-N-25027 is offered as a standard option. Installation and removal is reportedly convenient. Power tooling available.

Rosan, Inc., 2901 West Coast Hgwy., Newport Beach, Calif.

Use postpaid card. Circle No. 136

CLINCHING RING DESIGN MAKES NUT SELF-LOCKING

resist-

A nut for sheet metal fastening is self-locking, self-clinching and claims high torque and

pull-out

The design employs a clinching ring which, when squeezing pressure is applied, caused the sheet metal to flow around a back-tapered

shank, locking the fastener in the sheet with a flush fit on the reverse

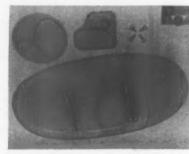
side.

The self-locking feature guards against relaxation and loosening in service and allows inherent flexing action of the semi-circular locking jaws. The nut is reusable. Performance: MIL-N-25027.

Penn Engineering and Mfg. Corp., Doylestown, Pa.

Use postpaid card. Circle No. 137

SEAL REPLACEMENT EASY WITH ACCESS DOOR O-RING



Access doors employing a replacement captive "O" ring seal, which requires no outside bonding agents, do away with the need for scrapping or returning doors for replacement of damaged seals.

The doors are used with self-sealing fasteners which make it possible for the main sealing media to be placed on the outboard portion of the door relative to the location of the fasteners, permitting more access room.

In tests, after two days under 50,000 psi cycles with no leakage, the door was disassembled, allowed to dry for 48 hours, reassembled with same "O" ring and fastener and again tested with no leakage.

Aero-Stat, 8021 South Western Ave., Los Angeles 47, Calif.

Use postpaid eard. Circle No. 138

MASTIC GASKETS, WASHERS -RUBBER COMPOUND SEAL

Mastic gaskets and washers provide a waterproof seal around bolts, screws and other fasteners used in mountings. Formed from a compound based on Plioflex, a synthetic rubber, the gasket seal through application of pressure and once in place will not become brittle, pull away or run. The products seal out air, dust, water and water vapor, adhere to metal, glass and plastic and will not crack or lose adhesion at 0° F or slump at 250° F. Gaskets and washers are available in materials which resist gasoline, oil aviation fuels, alcohols and solvents.

Presstite-Keystone Eng. Products Co., St. Louis, Mo. LF

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Use postpaid eard. Circle No. 139

RETAINER RESISTS 1000 LB. PARTS REMOVAL FORCE



Notching and grooving are eliminated by heavy-duty spring steel fastener which retains parts on plain round shafts, rods and axles. Part No. U37512 now available for %" diameter unthreaded round rod; requires 60 lb. push-on force and provides removal resistance of 1000 lbs. Over-all diameter is %" and height .085". Applied by pushing on plain rod with steel tubing applicator. Samples of Type U fastener available.

Palnut Co., Glen Rd., Mountainside, New Jersey.

Use postpaid eard. Circle No. 140

LUBRICANT EASES TIGHT-FIT ASSEMBLY



A lubricant used to facilitate the assembly of tight-fitting parts, threaded or otherwise, is reported to be effective on all metals, including stainless steel.

Nolox G-707 is applied by hand to the mating surfaces or by dipping or rubbing the lubricant into threads. It is said to permit precision pieces to be easily assembled and disassembled even after high heat.

Anchor Chemical Co., 10721 Briggs Rd., Cleveland, Ohio.

FURTHER PORMATION ITEMS VERTISED MENTIONED THIS ISSUE ..

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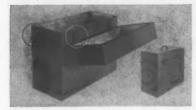
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Hinge-Lock insures a pressure-tight seal along the hinge line of containers and equipment cases. It is springless, impact and drop resistant, and provides matched hardware when used with Link-Lock fasteners.

The No. 2 medium duty Hinge-Lock has a load-carrying capacity to 1000 lb. tension; high preloading up to 450 lb. pull-down pressure. The No. 3 light duty model carries up to 300 lb. tension and 90 lb. pull-down pressure.

Simmons Fastener Corp., North Broadway, Albany 1, N.Y.

Use postpaid eard. Circle No. 142

TAPPING SCREW RESISTS STRIPPING OUT



Resistance to stripping out is the feature of a self-tapping screw developed for use with thin gage metal sheets. Called Hi-thred, the screw is threaded full to the head with the last thread actually terminating in an annular orifice in the head itself. This is reported to fasten securely without spinning or slipping.

Parker-Kalon Div., General American Transportation Corp., Clifton, N.J.

Use postpaid eard, Circle No. 143

SPOTWELD NUTS FOR THIN METAL



XN spotweld nuts can be welded to components with the same settings used to join assemblies and has an electrode "target" area (circular recess with beveled edges) that guides the weld tip into position,

Thinner metal in the welding area permits less current usage and less expensive welding equipment. The unit is designed primarily to be applied to thin sheets and allows placement where space is limited.

The nuts eliminate such processing as extruding and tapping and drilling and tapping

Ohio Nut and Bolt Co., Berea, Ohio.



RTH Thinwall Ring Die

The continuous surface of the Prutton one-piece rotary die boosts thread rolling production on screws and spiral nails to 600 pcs. per minute.

Producing fasteners . . . with record-breaking Prutton Planetary Thread Rolling Machines . . . is the answer to today's need for cost reduction. Only in Prutton machines will you find the exclusive, lower cost production features of Improved Hopper design; Improved Feed Tracking; and the better, faster Adjustment Facilities of the RTH Thinwall Die Ring!

*Pat. Applied For

Send complete details of your requirements for a proposal and estimate, today!



Remember!----

Prutton built the

FIRST GREATER NUMBER MORE VERSATILE BEST PERFORMING

Planetary Thread Rolling Machines



THE CITY THAT DIDN'T EXIST A MONTH AGO

Every 30 days the U.S. adds as many new Americans as live in Norfolk, Va.—creating brand-new wants and needs which must be satisfied.

What does this mean to you? It means greater opportunities than ever before—in all fields. Home construction is expected to double by 1975. Power companies plan to increase output 250% in the next 20 years to provide the power for scores of new labor-saving devices. Clothing suppliers predict a one-third increase in 7 years.

With 11,000 new citizen-consumers born every day, there's a new wave of opportunity coming.

7 BIG REASONS FOR CONFIDENCE IN AMERICA'S FUTURE

- More people . . . Four million babies yearly. U. S. population has doubled in last 50 years! And our prosperity curve has always followed our population curve.
- 2. More jobs . . . Though employment in some areas has fallen off, there are 15 million more jobs than in 1939—and there will be 22 million more in 1975 than today.
- More income . . . Family income after taxes is at an alltime high of \$5300—is expected to pass \$7000 by 1975.

- More production . . . U. S. production doubles every 20 years. We will require millions more people to make, sell and distribute our products.
- More savings . . . Individual savings are at highest level ever-\$340 billion-a record amount available for spending.
- More research . . . \$10 billion spent each year will pay off in more jobs, better living, whole new industries.
- 7. More needs . . . In the next few years we will need \$500 billion worth of schools, highways, homes, durable equipment. Meeting these needs will create new opportunities for everyone.

Add them up and you have the makings of another big upswing. Wise planners, builders and buyers will act now to get ready for it.

FREE! Send for this new 24-page illustrated booklet, "Your Great Future in a Growing America." Every American should know these facts. Drop a card today to: ADVERTISING COUNCIL, Box 10, Midtown Station, New York 18, N. Y.





(This space contributed as a public service by this magazine.)



To receive your copy of any literature reviewed here, use the postpaid card opposite page 64.

CONVEYORS

A well-laid-out 72-page catalog presents materials handling equipment. Profusely illustrated with both photos and diagrams, the two-color catalog shows typical installations of trolley roller, slat, chain, belt and special conveyors, providing valuable general information. Specifications of chains, attachment and fixtures, load bars, wheels and sprockets are listed. A partial list of users is included. Conveyor Systems, Inc., 6451 Main St., Morton Grove, Ill.

SET SCREW DRIVER

Performance of a new automatic setscrew driving device, called Setomatic, is reviewed in a four-page bulletin. Billed as both a building block for fully automated production lines as well as an attachment for a single machine, the device automatically feeds, inscripts and tightens socket set screws ranging in diameter from No. 4 to 3/8 inch, in lengths up to 34 inch. Speeds up to 2500 installations an hour are possible. The illustrated bulletin provides close-ups of feed and drive mechanisms and diagrams three modes of operation of the device. Standard Pressed Steel Co., Jenkintown, Pa.

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SEVEN-FASTENER LINE

Seven fasteners are completely described, shown in typical applications and accompanied by specifications in a 27-page publication. "Thread-cutting" springtites and sems eliminate tapping. Hoz-Fas-Ners fasten rubber, fabric or plastic hose to hose connections. Spring lock washers come in 116 sizes and maintain calibrated tension to compensate for dimensional change in a bolted assembly as a result of wear. Snap, bearing, lock and retainer rings of all types and sizes can be made from any 12 cold drawn steel sections. Terminal clamps with all type of heads, slotted

or Phillips—from 5/16" to 1" inclusive are available. Keps, preassembled nuts and lock washers, require only one hand for placing in position for driving. Reliance Div., Eaton Mfg. Co., 25 Charles Ave., S.E., Massillon, Ohio.

Use postpaid eard. Circle No. 3

PROJECTION WELDING

Projection welding fastener dimensions are charted in an eight-page booklet which also gives general information on resistance welding. Welding screws, pins, nuts, flanged weld, Johnson weldnuts—all described—can be welded successfully to materials .030 to ¼" thick and are available in stainless steel, monel metal, brass and low carbon steel. The National Screw & Mfg. Co., Cleveland 4, Ohio and Los Angeles 22, Calif.

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RIVET APPLICATION

Automatic rivet setting—how to choose both unit and machine—is featured in 49-page hard-cover catalog. Over 40 stationary rivet setters are ilustrated and accompanied by specifications. Operating safety, accessibility of parts for servicing, special anvil features and other design elements covered. Complete rivet line presented. Chicago Rivet & Machine Co., 9600 W. Jackson B.vd., Bellwood, Ill.

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JIGS AND FIXTURE PARTS

Component parts of jigs and fixtures are diagrammed, with specification tables for different sizes, in a 24-page catalog. Items as jig feet leveling assembly, adjustable locating buttons, studs, flat washers, spherical nut and washer, shoulder screws, C washers, and others, are illustrated and described. Carr Lane Mfg. Co., 4200 Krause Court, St. Louis 19, Mo.



(See 6)



(See 2)



(See 1)

HEX-SOCKET SCREWS

Engineers dealing with hex-socket screws will appreciate this complete 109-page, pocket-sized handbook, publication G-23. Dimensional standards, thread lengths, mechanical properties, tightening torques, design data, suggested taps, electroplated finishes and surface treatments, key fit table, hardness conversion table and other important subjects are given in easy-to-find form. The manufacturer's own line is presented in a multi-colored insert. Allen Mfg. Co., Hartford 2, Conn.

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NATIONAL THREAD DATA

"Unified and American National Screw Thread Data" is the subject of "H & G Die Headlines" digest. The 11-page loose-leaflet presents the major, minor and pitch diameters giving the classes, allowances, tolerances of all internal and external threads up through 2". Particularly slanted for readers in thread designing, gaging and inspection and production of threaded parts. Eastern Machine Screw Corp., 25-48 Barclay St., New Haven 6, Conn.

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NICKEL BRAZING ALLOY

Nicrobraz 50, new nickel-base brazing alloy for high-temperature service, is covered in an illustrated two-color engineering data sheet (No. 22). Itemized are the alloy's metallurgical and engineering properties and available forms and nominal composition. Typical applications and brazing techniques are included. Stainless Processing Div., Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich.

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HYDRAULIC C-PRESS

Automatic hydraulic C-Press, adaptable to 32 applications including assembling and riveting, is presented in attractive 11-page bulletin. New model features, performance, accessories, index table and dimensions are outlined. Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

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7,000 FASTENERS

Over 7,000 fastening items are cataloged and several pages of helpful data are added in a 23-page publication (No. 56-A). Among the new products listed are continuous or piano-type stainless steel hingers and butt hingers in blank, fixed pin and loose pin types. About 30 sizes shown. A group of screw machine products illustrated include knurled and drilled parts, milled and

drilled parts, dowel pins, tapered and grooved parts, broached parts, captive screws, tapered ball shaped, special tapered holes, milled AN bolts (extra long length), headed parts, shafts, etc. Star Stainless Screw Co., 655 Union Blvd., Paterson 2, N.J.

Use postpaid card. Circle No. 11

WASHERS

Washers ranging from ¼" to 8" O.D. with thicknesses from .008" to ½" are presented in an easily-read catalog. Specifications, weight and diameter tables and other information printed in large type. Joliet Wrought Washer Co., Joliet, Ill.

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STAINLESS STEEL LINE

Stainless steel fasteners are cataloged in a 48-page indexed stock list and data book. A complete line of 12 types of standard screws are available, as well as bolts, rivets, nuts, washers, balls, pins, nails, studs, rods, keys. Ten pages are devoted to helpful tables on AN specifications, nominal composition, corrosion resistance, estimated weights and applications of stainless steel products. Allmetal Screw Products Co., Inc., Garden City, N.Y.

Use postpaid card. Circle No. 13

CONTRACT METAL STAMPING

Specialists in contract manufacture of metal stampings, drawn shells, eyelets present their facilities in attractive 10-page bulletin. Engineers will study individual problems. Quality emphasized. Cly-Del Mfg. Co., Sharon Rd., Waterbury 20, Com.

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STUD WELDING EXPLAINED

Stored energy stud welding is said to combine the best features of resistance and arc welding. A loose-leaf folder describes their applications. Sequence charts show joining process. Five welding machine models available. Graham Mfg. Corp., 152 Needham Heights, Mass.

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SELF-SEALING FASTENERS

High pressure self-sealing fasteners which seal out dust fumes and moisture are illustrated in a four-page folder (Catalog H). Steelskrews, bolts, rivets are designed for vibration resistance in critical sealing applications. Dimensions, thread sizes grouped so that folder may be used as wall chart. Automatic and Precision Mfg. Co., 252 Hawthorne Ave., Yonkers, N.Y.

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THREAD ROLLING TOOLS

Three new thread rolling machine models illustrated in brochure, which claims economy through speed. "Planetary die" principle enables rolling of many special sizes and shapes. Maximum efficiency at 600-800 pieces per minute; claims fastest setup time. Specifications listed. Prutton Corp., 5295 W. 130th St., Cleveland 30, Ohio.

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RETAINING LOCKNUT

"Bearhug" Locknut—for retaining anti-friction bearings on spindles and shafts is presented in four-page bulletin. Design and performance features, supported by dimensional specification drawings and table, assist in selecting the right nut for the job. Bearing Locknut & Machine Co., 4 Union Ave., Irvington, N.J.

Use postpaid card, Circle No. 18

BLIND RIVETING

High-speed blind riveting is introduced in a two-color brochure. Pneumatic or manually operated riveters drive up to 2000 rivets an hour. Automatic loading, placing, setting described. Six types of rivets, three model guns illustrated. Aviation Dev. Inc., 210 S. Victory Blvd., Burbank, Calif.

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MINIATURE THREADS, TOOLS
Helpful data on miniature taps, dies,

Helpful data on miniature taps, dies, screws, drills and tools is combined with details of the new line in an illustrated folder. Listed are the dimensional data on all sizes in their range of 56 to 160 threads per inch as well as stock prices and an outline of special order facilities. J. I. Morris Co., 394 Elm St., Southbridge, Mass.

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CYCLE BONDING MACHINES

Machines which cycle bond 200 parts an hour (Model 20CBR), and others, are emphasized in an attractive loose-leaf folder. Adhesive bonding is explained and the machine line features—output, flexibility, efficiency, control, construction, tolling—are explained. Stationary and rotary models available. Modern Industrial Eng. Co., Detroit 38, Mich.

Use postpaid eard. Circle No. 21

PRESS TYPE SPOT WELDER

The Series P-20 air-operated, press type spot welder is compactly presented in leaflet form. The machine has a capacity exceeding 200 spots per minute depending on gauge; a welding capacity and dimensional chart lists its capabilities. Peer, Inc., 1200 Milton St., Benton Harbor, Mich.

ARC TANDEM WELDING

Increased welding speeds and improved control of bead shape are the claimed advantages of multiple electrode submerged arc tandem welding over single arc operation, according to Bulletin 5200.2. Tandem welding employs two or more separate arcs operating in close proximity, one behind the other, on the same weld bead. The fourpage bulletin describes the process in detail, presents information on application opportunities and requirements and outlines commonly used equipment arrangements. Lincoln Electric Co., Cleveland 17, Ohio.

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HANDLING EQUIPMENT

Materials-handling equipment, especially for the fasteners industry, is described in a loose-leaf folder. Summit Stak horizontal and vertical storage racks are said to increase steel coil storage capacity up to 62% and streamline handling through more orderly "filing" of alloys and sizes and easier access to each type of coil. The kegfilling machine is a new development for automatically filling shipping containers with finished bolts, nuts, etc. Summit Steel Corp., 430 Morgan Ave., Akron 11, Ohio.

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SLOTTED FRAMING STEEL

A detailed construction handbook for use with the new AIM Brand Slotted Angle gives assembly instructions for forming the framing materials into a wide range of storage, materials handling and maintenance structures. Complete load tables are included for both standard and heavy-duty slotted angle. All accessory items including the special cutter which makes a clean, square cut with one stroke of the handle, are illustrated and described. Acme Steel Co., 135th St. & Perry Ave., Chicago 27, Ill.

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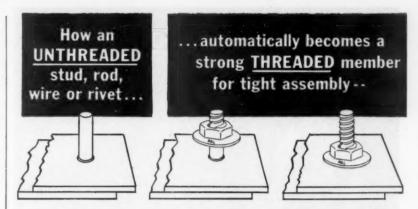
THREADED FASTENERS

Lok-thred's principle for effective fastening is demonstrated in an attractive two-color folder. Diagrams point out that the entering screw, bushing or stud thread reforms the standard socket thread to its own contour, thus forming a near-perfect mating and locking the whole under pressure against the 6° tapped root surface. Strength in tension, torsion and shear is the result. Lock Thread Corp., 2832 East Grand Blvd., Detroit 11, Mich.

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SELF-LOCKING CLINCH NUTS

Design Manual 5803 reviews available standard and miniature types of clinch nuts for the avionic, electronic and electrical equipment industries. Major features of the 18-page handbook include a visual-descriptive index of all clinch nut types; a guide to selection of the correct fastener type to the job requirement; installation "tips" for best results in production; suggestions for installation tools and their effective use; drawings covering each part and giving



-when fastened with low-cost, high-speed

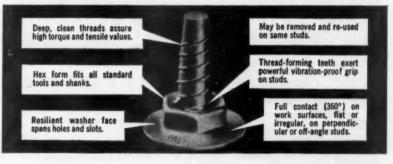
PALNUT® SELF-THREADING LOCK NUTS

PALNUT Self-threading Lock Nuts are spring-tempered steel fasteners with a special thread-forming design. Fastening operation forms threads while tightening. Effective on zinc, aluminum, steel or brass. Assembly is easy and fast using standard tools—extra fast using PALNUT magnetized wrenches. Hold tight under vibration whether seated or unseated.



TYPE ST--WASHER BASE

This one-piece Self-threading nut performs functions of ordinary nut, lockwasher and flat washer. Available in several base diameters; also with bonded-in plastisol compound to seal out water and dirt. Sizes for ½", ¾" and ¼" dia. unthreaded studs and rod.





TYPE RST-- REGULAR HEX

This compact Self-threading nut requires shorter stud or rod space, less seating area. Costs less, assembles as fast as push-on nuts, parts stay tighter, can be removed and re-used. May be driven with internal wrench. Sizes for ½", ½" and ¾" dia. unthreaded studs and rod.

Write for literature and free samples, stating type, size and application.

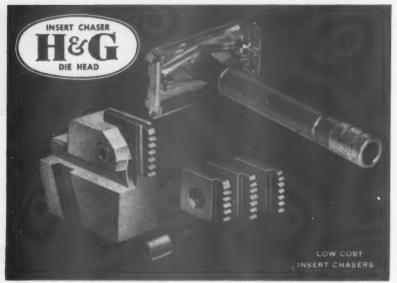
THE PALNUT COMPANY, 79 Gien Road, Mountainside, N. J. In Canada: P. L. Robertson Co., Ltd., Milton, Ont.



FASTENERS



Quick, secure fastening at low cost



FOR LESS THAN \$50 YOU GET 12 SETS, EACH SET GROUND READY TO GO

Men would not accept either idea at first . . .

INSERT CHASERS SAVE UP TO 33%

Insert chasers are like safety razor blades: they cost so little that you can throw them away when dull. Or, for utmost economy, you can resharpen them over and over again. Only a flash grind is required. For less than \$50 you get a dozen sets of %—16 insert chasers, each set ground ready to go. You will be amazed at the quantity of threads they will cut, even to Class 3 specifications, with a minimum of downtime. FREE: "Unified and American Screw Thread Data."

THE EASTERN MACHINE SCREW CORPORATION 25-48 Barclay St., New Haven, Conn.
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Use postpaid card. Circle No. 247

thread size, availability, temperature range and part dimensions. Dept. C, Elastic Stop Nut Corp. of America, 2330 Vauxhall Rd., Union, N.J.

Use postpaid card. Circle No. 27

METAL STITCHING

Metal stitching, a relatively new process claiming large savings on jobs where it is suitable, is presented in two-color brochure. Application, uses, specifications, question and answer section, testimonies and illustrations of four available model stitchers shown. Bostitch, Westerly, R.I.

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MATERIALS HINGE BINDER

The Swing Hinge Binder, described in a four-page brochure, is recommended for housing material in a constant state of flux. The publication illustrates step-by-step how material is added or deleted without disturbance or removal of the balance of contents. Sizes are available up to 14"x14". Royal McBee Corp. Westchester Ave., Port Chester, N.Y.

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RETAINING RINGS

Engineering specifications for a fourseries line of retaining rings have been published in a 16-page catalog. Series 1000 and 2000, external rings applied radially to shafts, can be ordered stacked on metal rods ready for use. Series 3000 (NAS 50, 669) are internal rings applied axially into housings while Series 3100 are external rings applied axially to shafts. Industrial Retaining Ring Co., 57 Cordier St., Irvington 11, NJ.

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TITANIUM WELDING METHODS

"Titanium Welding Techniques" is a comprehensive 32-page how-to-do it handbook on both fusion and resistance welding. Equipment, methods and typical weldments are treated, as well as procedure for evaluating weld quality and the properties of weldable grades of the metal. Titanium Metals Corp. of America, Henderson, Nev.

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SUB-MINIATURE INSERTS

Sub-miniature inserts and studs offer design engineers new opportunities for making smaller assemblies, according to data sheet, describing unusual line in 0-4 thread sizes. Features, applications, ordering information presented. Kelox, Fasteners, Inc., 580 Fifth Ave., New York 36, N.Y.

FASTENER APPLICATION

A 16-page illustrated pocketsize booklet "Helpful Hints" contains technical facts to help users obtain maximum economy and performance in application of standard fasteners. Information on selecting the right grade of bolt, proper torque for bolts, bolt stresses, calculating proper bolt loading, tightening limitations, safety factor, threads and protective coatings. Facts about nuts—grades and strength, use and abuse—are also related. A section is devoted to selection of tapping screws; charts show safe load curves and torque curves for various diameters and grades of bolts. Russell, Burdsall & Ward Bolt and Nut Co., 101 Midland Ave., Port Chester, N.Y.

Use postpaid card. Circle No. 33

VARIED NUT LINE

Clinch, weld, spring clip nuts and nut washers are cataloged in loose-leaf folder. Dimensional line drawings and specifications for each product attractively presented. Mount Clemens Metal Products Co., 145 South Rose St., Mount Clemens, Mich.

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NYLON PELLET LOCK SCREWS

How nylon pellets set into socket screws cause lasting locking is described in a four-page brochure, complete with illustrations and specifications. The line includes socket head cap screws, button head socket, flat head socket cap, socket set, shoulder screws and pressure plugs. Cleveland Cap Screw Co., 4444 Lee Rd., Cleveland 28, Ohio.

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AIRCRAFT FASTENERS

Aircraft assembliers will be interested in literature on Huckbolt fasteners and stumps. Features are presented in cartoon form followed by 11 pages of nomenclature, specifications on the fasteners and both pneumatic and hydraulic driving tools. Recommended inspection methods presented. Huck Mfg. Co., 2480 Bellevue Ave., Detroit 7, Mich.

PIERCE AND CLINCH NUTS

How pierce and clinch nut tooling can integrate with a company's present equipment is featured in a well-illustrated brochure. Application techniques which can be adapted to use product are progressive die installation, force-feed telescoping unit, attaching machine, press brake installation, hand-fed piercing die and high-production tooling set-up. The action of clinch and



CAMLOC low cost/light weight

5F series

Camloc's new small, lightweight 5F Series features high strength-weight ratio plus the quick-operating advantages of a ¼-turn fastener... in a size and weight that offers new design possibilities to original equipment manufacturers! Particularly adaptable to thin materials and miniaturized equipment like airborne electronics, small electro-mechanical and computing devices and communications components. Ideal for attaching lightweight components in "packaged" equipment or for holding access panels on everything from washing machines to radar units.

Offered in many different head styles. Complete specifications will be sent to you on request.



CAMLOC FASTENER CORPORATION

14 Spring Valley Road, Paramus, N. J.

WEST COAST OFFICE: 5410 WILSHIRE BLVD., LOS ANGELES, CAL. FORT WORTH OFFICE: 2509 W. BERRY ST., FORT WORTH, TEXAS Use postpaid card. Circle No. 248 pierce nuts is compared in seven ways with five other commonly used nuts. Condensed specifications are given. Also diagrammatically described is the action of the Multi-Pierce head which precision inserts pierce nuts, each of which punches its own assembly hole in one press stroke, inserts and secures firmly. Fabristeel Products, Inc., 21500 W. Eight Mile Rd., Detroit 19, Mich.

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COLD-PROCESSED RIVETS

Anyone concerned with rivets could use this practical six-page reference manual. Discussions are held on the selection of proper rivets and design tips, both well illustrated. The manufacturer points out the advantages of his cold forming process and gives specifications of semi-tubular, bifurated and cutlery rivets. Milford Rivet & Machine Co., Milford, Conn.
Use postpaid card. Circle No. 38

SPRING CLIP DESIGN

The specifications and design, use and prices of a precision spring clip line are easily pinpointed in a quick-reading bulletin. The reusable clips, heat treated to prevent distortion, hold shafts and other moving parts in place on all types of office equipment, small mechanical parts and electronic and electrical devices. Connor Spring Mfg. Co., 75 Fourteenth St., San Francisco 3, Calif.

Use postpald card. Circle No. 39

LOCKING THREADS

Lok-Thred is compared with standard American National screw thread in a 31-page booklet. The 11 claimed advantages of the line-whose major modification is a larger root diameter and wider root surface that is tapered 6° longitudinally to the axis of the thread—are fully treated. Fit, fatigue limit, sealing, re-usability, gage factors and applications are covered. Lock Thread Corp., 2823 E. Grand Blvd., Detroit 11, Mich.

Use nextuald eard. Circle No. 40

DIE CAST FASTENERS

The only die cast threaded fastener

line in the world is described in a wellillustrated catalog. High-speed production of die cast zinc alloy and molded nylon units enable offering as standard items many fasteners obtainable only on special order from sources using conventional methods. Featured are injection molded nylon fasteners, including machine screws, headless set screws, screw insulators and bushings, washers, as well as specials. These fasteners claim properties of high strength-to-weight ratio, excellent electrical insulation, elasticity and resiliency, resistance to chemicals and corrosion. Gries Reproducer Corp., 125 Beechwood Ave., New Rochelle, N.Y.

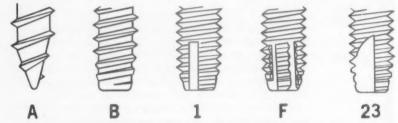
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DESIGN FACTORS IN SELECTING TAPPING SCREWS

Analyzing design factors instead of using conventional rules of thumb in the selection of tapping screws will provide easier assembly and greater assurance of a sound joint, according to fastener

spaced longitudinal slots, drives straighter than the other types.

Where load is no factor, thickness of the metal determines the diameter of the screw. Use a screw with thread



specialists at Russell, Burdsall & Ward Bolt and Nut Co. Here are the most important factors to consider in select-

ing tapping screws.

Of the five common types of tapping screws two are thread forming and three are thread cutting. The thread forming screws should be used when the material is ductile enough to permit the deforming action of the screw. Type A is pointed and used in pierced rather than drilled holes and where the exposed point doesn't matter.

Where type A and B screws can't be driven (because too much driving effort is required owing to the hardness or thickness of the material), one of the thread cutting screws should be used. For hard, ductile materials, type 1 is best; for soft, friable materials, type 23 or 25. Type F, which has four equallypitch that will give at least one full thread engagement in the metal. For example, with metal 0.0625-inch thick, any screw with at least 16 threads per inch can be used.

Where load is a factor, select a screw with sufficient strength and one that provides the greatest thread engagement -four or five threads fully engaged, if possible. If the screw that is large enough to develop sufficient holding power doesn't provide sufficient thread engagement, use smaller screws.

Size of the hole in the metals to be joined is important. If the hole is too large, the screw cannot develop sufficient thread depth; if it's too small, the screw will be difficult to drive. The required hole size will vary with the thickness of the material, type of material and style of screw.

TRIPLE-DUTY INSERT

An insert with male thread which will lock, anchor and seal effectively is described in two-color brochure. Design characteristics, uses and suggestions are presented in graphic form for quick and easy study. Axial tolerance is taken up by resilient insert material causing metal-to-metal "drag." Radial tolerance is taken up because the side opposite the insert is forced into close contact for additional "drag." Torsional resistance completes the locking principle. Long-Lok Corp., 2018 Colorado Ave., Santa Monica, Calif.
Use pestpaid card. Circle No. 42





TOGGLE HEADER LINE

Toggle and toggle transfer headers and tubular rivet headers are used for upsetting heads on screw and rivet blanks that require more than one blow. The operation is described and model specifications given in circular No. 854-A-4. Entire line of metal working equipment listed on back cover. Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Use postpaid card. Circle No. 43

"CARBON RESTORATION"

A process of "carbon restoration" is given credit for the strong fastener line described in a brochure designed for quick reading. Vital surface carbon is restored in a controlled process during final heat-treating of set and cap screws, bolts, pins, hexagon keys and nuts. This eliminates the surface layer of soft, decarburized steel which causes excessive wear, thread stripping or actual breakage. The Chicago Screw Co., 2500 Washington Blvd., Bellwood,

Use postenid eard. Circle No. 44

STUDS, INSERTS, DRIVERS

Complete specifications and data on product line of studs, inserts and power driving tools treated in 41-page catalog. Locking principle incorporates serrated collar. Varied applications described. Charts show types of material product available in, design and installation. New knife thread insert for fastening in wood presented. Rosan, Inc., 2901 West Coast Hwy., Newport Beach, Calif. Use postpaid eard. Circle No. 45

INSERT ASSEMBLY TOOL

An assembly machine which places and anchors Dodge expansion inserts as fast as 72 per minute is introduced by a flyer. The orientating equipment can be adopted to existing setups as arbor presses, foot presses, etc., eliminating manual operation. Phelps Mfg. Co., Box 542, Westport, Conn.

SCREW FEEDER

Photos of the Zipp screw feeder in action, with explanatory data, make up a bulletin on this machine which eliminates manual placement of screws. The machine fits all makes of pneumatic tools, can be mounted in many different ways and is adaptable to multiple setups to drive screws in multi-pattern of two or more. Also pictured is the new Radarm, portable tool mounted with a range of 60" to 84". R. C. Neal Co., Inc., 76 Pearl St., Buffalo 2, N.Y. Use peetpaid card. Circle No. 47

STAKING PIERCE-NUTS

A catalog describes Strippit pierce nut units for staking Fabristeel nuts into steel metal for assembly panel production. Operation and specifications of the press-actuated type "CD" and "BL" units for short, medium and long runs of nut insertions are fully covered in the catalog, including flat and embossing dies and sizes and threads of Fabristeel multipierce nuts available for the units. Copies may be had by writing Wales-Strippit, Inc., 204 South Buell Rd., Akron, N.Y.
Use pestpaid card. Circle No. 48

BONDING PLATES

A four page bulletin describes four self-bonding methods of applying .003" anodized aluminum nameplates for product identification. Bulletin No. 177 describes application of Quik-Plates to different types of surfaces, application time, serial numbering, MIL specifica-tions, tools available for productionline application. Samples available.

W. H. Brady Co., 727 West Glendale Ave., Milwaukee 9, Wis. Use postpaid eard. Circle No. 49

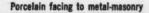
LOCKNUT LINE

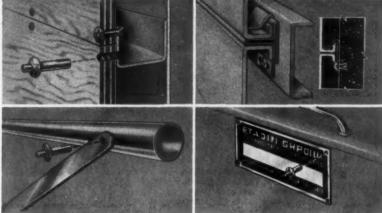
Handy loose-leaf brochure describes locknut-combining standard nut and retainer in one self-locking unit. Cutaways reveal nomenclature, photographs show entire line. Specifications listed for American standard heavy and thin, finished hexagon and thin nuts, Railloc square locknuts, large nuts (3\%" to 6\%" width across flats). Also presented are the assembly and specifications of Studloc for locking tappet adjusting screws, cylinder head studs, housing covers and flange studs in place. Security Locknut Corp., 1800 N. 15th Ave., Melrose Park, Ill.
Use pestpaid card, Circle No. 50

APPLYING CLINCH-NUTS

Punch and die button sets which pierce and clinch a nut with one stroke of the press are described in a twocolor guide designed for products calling for multiple thread sheet metal fastening. Clinch nuts are fed automatically and inserted by an interchange-able magnetic punch and mating die button and the advantages of formed hole fastening are pointed out. Dimensional data on clinch nut punches and die buttons, thread-hole forming punches and die buttons and Simmons spring-lock type fasteners are given. Richard Brothers Punch Div., Allied Products Corp., 26500 Capitol Ave., Detroit 39, Mich.
Use postpaid card. Circle No. 51

Plywood sheathing to metal frame





Metal components riveted together

Name plates secured to equipment

for high speed riveting with an ordinary hammer



Star Pin-Grip hammer-drive blind star Pin-Grip nammer-drive blind rivet eliminates the need for explo-sives, special tools or special skills. Pin-Grip does the job of a conventional rivet—faster, easier, safer, with real economies in time and labor. Aluminum alloy body of Pin-Grip is

assembled with a stainless steel, assembled with a stainless steel, knurled drive pin (or on special order with aluminum drive pin). Wide range of Pin-Grip sizes available with these head styles: Universal, 100° Countersunk, Full Brazier, Panel, Splash Flat and Splash Round.



metal to metal metal to wood

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Assembly and Fastener Engineering



MACHINE INSTALLS 4800 RIVETS AN HOUR

A \$500,000 riveting machine is doing the work of 40 hand riveters for Dorsey Trailers, Inc., Elba, Ala. Called the world's largest and fastest automatic riveter, the electronic Drivmatic was designed and built by General Riveters after two years of study.

The machine is of the type which previously was used exclusively in the aircraft industry. It installs 80 rivets a minute with four riveting heads for trailer sides, front and roof.

Installation involved adapting the machine to a bridge-type structure large enough to handle an entire van side as a complete unit. During application, the sheets and stiffeners for a side are assembled in a frame, which moves through the riveter on a table. Riveting starts at one panel corner, goes down the row, jumps to the next and comes back, and so forth. Meanwhile the frame serves as a jig to hold the structure rigidly in place. A template activates the electronic controls.

Four individual operations are combined into one continuous cycle: clamping side sheet and stiffener post together at the point to be riveted; drilling hole; inserting rivet; pressure-tightening the rivet (while the rivet head is held by buckling anvil, hydraulic ram upsets the bottom of the slub with a squeezing action).

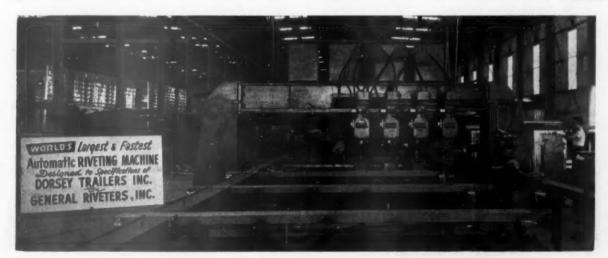
WELDING LEADER TO HELP PROMOTE U.N.



Rene D. Wasserman, president of Eutectic Welding Alloys Corp., has been appointed welding industry chairman of the United States Committee for the United Nations. Leaders of the welding industry throughout America are being asked to support this committee whose work depends on private subscription.

The non-partisan committee of national organizations undertakes the public relations task of disseminating information about the United Nations and promotes the observance of UN Day in this country.

continued



Commenting on the objectives of the campaign, Mr. Wasserman says: "Nothing is more important than the UN's work for peace during this troubled time. The work of the USC-UN gives everyone an opportunity to share in a great and glorious task, not only for our country alone, but in behalf of every free country of the world. Many are cooperating in bringing success to this achievement. And the welding industry will certainly do its share."

industry will certainly do its share."

Contributions should be sent directly to the United States

Committee for the United Nations, 816 Twenty First Street,

N.W., Washington 6, D.C.

U.S. ASSEMBLY SPEED AMAZES DUTCHMEN



Two Dutch aeronautical engineering students, who spent the summer gaining on-the-job knowledge working for Beech Aircraft, commented before leaving: "It's quite a sensation to work where planes are built by the day, and not the month as in Europe." Willem Stoel, 24, and Jan Werkman, 22, are pictured above at work on the Bonanza and Travel Air assembly line in Wichita (Kans.) Plant II under the supervision of foreman Howard Hall. Enrolled at Delft Technical College, The Netherlands, the men were granted permission by the Pentagon to accept Beechcraft's invitation.

LINCOLN ELECTRIC BUILDS IN AUSTRALIA

The Lincoln Electric Co. (Australia) Pty. Ltd. is modeling a new Sydney plant after its Cleveland facility. Arc welding equipment and supplies will be manufactured.

The building will be completely windowless, air conditioned with tempered air and access to the plant will be through two tunnels, one for personnel and the other a service way. Receiving docks are at the back of the building, shipping docks to the front. Material will flow through the manufacturing process from back to front. The office area is in the center of the plant, completely surrounded by the manufacturing facilities.

GROOV-PIN ELECTS BRAENDEL PRESIDENT

Felix W. Braendel has been elected president of the Groov-Pin Corp., Ridgefield, N.J. The former executive vice-president has designed much of the automatic production machinery used by the company since joining firm in 1936 as an engineer. Two other executive assignments announced by the Board of Directors: Mrs. E. F. Schniewind, vice-president and secretary; F. O. Becker, vice-president and treasurer. Both had been associated



with the firm in other executive capacities.

BLACK & WEBSTER BUYS OUT BLAKE CO.

All the capital stock of Edward Blake Co. of West Newton, Mass., has been purchased by Black & Webster, Inc., Newton, Mass., makers of solenoid operated production tools.

No change in any of the policies of the Blake Co. is contemplated, manufacturer and distributor of precision tap and drill grinders. Former owner and president Edward Blake will remain as a consultant.

HUCK EMPLOYS STRESS-RESEARCHER HYLER

W. S. Hyler has been appointed technical assistant to the vice-president of research, H. G. Brilmyer, at Huck Mfg. Co., Detroit. He comes from the Battelle, Ohio, Memorial Institute where he was assistant division chief in the Applied Mechanics Division, Hyler has worked extensively in the field of fatigue of metals and structures, stress analysis and application of mechanical strength behavior to design criteria. Hyler is the



author of numerous technical papers, NACA reports and WADC reports. He is a member of A.S.M.E., the A.S.T.M. Committee E-9 on fatigue and is chairman of the survey sub-committee.

NEW TERRITORIES FOR AMWELD SALESMEN

Three representatives have been newly appointed to national sales territories for the American Welding & Mfg. Co.: Joseph Kimpan, New England; Donald Manning, Chicago-Wisconsin-Iowa; Wilson Marks, Ohio-Indiana.



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SIEGLER'S BROOKS ELECTED EIA DIRECTOR

John G. Brooks, president of The Siegler Corporation, has been named to the board of directors of the Electronic Industries Association, it is announced by David R. Hull, president of the industry group. The Electronic Industries Association (EIA) is a national organization representing major manufacturers of electronic equipment with headquarters in Washington, D.C. Brooks was elected to the EIA board of directors during the organization's semi-annual meeting.



CORNELL SWEEPS WELDING DESIGN AWARDS

Five engineering undergraduates at Cornell University received all of the top awards this year in the annual mechanical and structural welded design competition sponsored by The James F. Lincoln Arc Welding Foundation of Cleveland. Ohio.

Top award of \$1250 went to Richard Jarvis of Baltimore, Md., for his design of a triangular-shaped foot bridge. John Jenner of LeRoy, N.Y., and E. R. McLean of Philadelphia, Pa., shared the \$1000 second award for the mechanical design of an automatic welding machine. Gordon Kraus and Robert Spicher designed a display arboretum, winning \$500. The school also received \$1750 in scholarship funds.

ELFENBEIN TO DIRECT P-K MARKETING

The appointment of Harold L. Elfenbein as marketing director was announced by Parker-Kalon Division, General American Transportation Corp., Clifton, N.J. fastener manufacturer. Elfenbein retains the position of advertising manager, which he has held for thirteen years, in addition to his new marketing responsibilities. The firm produces a complete line of threaded fasteners and a new automatic screw driving machine.



MIDLAND TRANSFERS SELLIN TO CALIF.

Midland Screw Corp., Chicago, announced the transfer of Robert Sellin, assistant general manager and comptroller, to Los Angeles as branch manager. Joseph Shay was promoted to supervisor of accounting at the general office in Chicago. Sales on the West Coast will be under Lee B. Doddridge,

vice president, in Los Angeles.





RIVET

When the jaws of this solid copper veeslot terminal are squeezed, pressed, swedged, or hammered together, the wire is permanently clamped in a vise-tight grip that affords maximum contact for full current flow. Standard sizes are available in either screw or rivet types.

SQUEEZES CLOSED HOLDS WIRE TIGHT

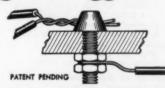
SCREW

TYPE

Closure is accomplished rapidly and accurately on the production line by the use of simple power press tools. Engineering drawings for the tool design will be furnished by Elco on request. For hand work, a die and anvil can be attached to the faces of parallel pliers. For single applications, the jaws of the terminal can just be hammered together, or peened over.



APPLICATIONS
OF RIVET AND
SCREW TYPES



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Since this is a new product with many advantages and features, the extent of possible applications and the range of benefits and savings have yet to be fully explored. We invite you to . . .

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. . . so that we may have an opportunity to work up applications for you. Our Engineering Department is at your service, ready to help in any way they can.



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Ingenuity and creative engineering, resulting from compliance with health codes, brings a big cost reduction in vending machines.

33-Resistance Welding and Hot Heading Small Parts

Victor Adding Machine switches production techniques to assure high quality of certain precision components.

36-Fasteners in the Space Age

Engineering and purchasing departments in industry and government must recognize that fasteners are an important part of today's technology.

42-From Bicycles to School Furniture

Westfield integrates new product line into existing facilities, utilizing virtually the same production equipment.

47-The Role of Stainless Steel in Fasteners

Presenting examples of how stainless steel can provide practical solutions to some of industry's most difficult fastening problems.

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17—Hardware Train Saves Time and Money

A tractor pulling three hardware trailers is saving Chance Vought Aircraft an estimated 15,720 man-hours a year.

18—Assembly Instructions Via Taped Recordings

Dictaphone development contributes to increased productivity and less worker fatigue in test at Westinghouse.

21-Ultrasonic Machine Spotwelds Without Fusion

Aeroprojects develops method of joining dissimilar metals without fusion or external deformation.

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23-New Alloy Bracket Resists 15,000 Lbs. Thrust

Brackets, made from an alloy called A-286, are used by Convair to tie down engine on Delta Dart interceptor.

24-Quick-Release Couplings for Flight Refuel Tanks

V-band couplings are used by Harbor Boat to meet Navy specifications for pressurized fiberglass containers.

26-Self-Locking Inserts Cut Wrench Maintenance

Miller Falls had reduced maintenance costs and simplified assembly of new wrench with self-locking wire thread insert.

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November, 1958



ONE LAST WORD

THE PLEADING MAIDEN IN OUTER SPACE



A n educator, in a recent speech, questioned the value to mankind of mortals rocketing through space to reach the moon. "Lunar madness. Whatever for?" he asked. And thus speaks education without imagination, knowledge without wisdom. "Whatever for," indeed!

To wonder at the value of subduing outer space is really to beg the question. It must be conquered. It is there. The child in each of us understands this need. The child who years ago shuddered deliciously at haunted houses, caves and pathless woods is the same child, grown, who guides the Spirit of St. Louis, captains the Santa Maria or commands the march of the legions through Gaul. Outer space and the moon are on the hero's list because they are there, just as the empty cave and creaking house were there, pleading to be explored and conquered. And so, when we read of scientists whooshing a one-eyed, 82 pound basketball 79.000 miles into a black nothingness, the heart should beat a little faster and the senses thrill at the heroics of it.

In our age, however, to conquer that which is there is no longer, alas, the deed of one hero. Never have so many minds, in such diverse occupations, struggled so valiantly and diligently to attain perfection. And that is, in this of all possible worlds the most imperfect, a remarkable thing. Men, scattered far and wide, dedicated to flawless perfection. Oh, the magnificence of this! No scientific area is untouched. It is as though Archimedes, Euclid, Klepner,

Newton, Einstein and the tens of thousands of dead and living, known and unknown, scientists, technicians and engineers had labored but to touch the moon.

We live, for better or for worse, in an age of shabby craftsmanship, and a deterioration of moral values. The idea of doing a splendid job for its own sake and for the sake of personal, inward satisfaction of the thing is almost dead. Or so we believe until here, suddenly, out of nowhere, we are awakened by a magnificent attempt at perfection. Is there not encouragement in this, and hope? And wouldn't this splendid achievement of the human mind be sufficient answer to, "Whatever for?"

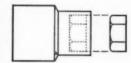
"By the obstacles is the hero measured," says Constantine. Outer space does not give up its secrets easily; and the pale hand of the moon-maiden is not won with a song. But compounded with the problems of nature have been the man-made problems: blind ignorance, small ideas, selfish jealousies, dollar-grubbing minds and committees, silly little bureaucrats snooping and sniping . . . but such obstacles have ever been with us, and it will always be thus. They always wither and die in the cold shadow of success. But as long as the divine spark and the love of adventure live in the hearts of men, as long as men would stand with Cortez, 'Silent, upon a peak in Darien,' and as long as the moon in her cloak of outer space is there, beckoning and calling nightly, so long will the man live up to the promise of the child: to conquer it because it is there.

"I have yet to encounter that common myth of weak men, an insurmountable barrier." James Lane Allen

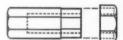
Wm. 1. Schleister

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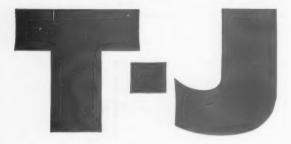
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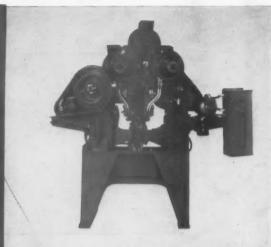
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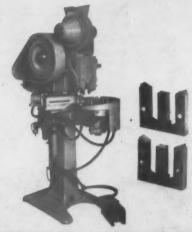
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Send today for these helpful references: Rivitor bulletins 646 and 555... Clinchor bulletin 555. The Tomkins-Johnson Co., 627 N. Mechanic St., Jackson, Mich.





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